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# COMPUTERWORLD

# P5 delay doesn't vex users

*Intel reschedules rollout to avoid DX2 overlap, ensure high chip yields*

BY CAROL HILDEBRAND
CW STAFF

SANTA CLARA, Calif. — A combination of manufacturing logistics and a determination not to let history repeat itself has forced Intel Corp. to push back the formal announcement of its next-generation microprocessor, moving it into the first quarter of 1993. Users interviewed last week said the delay would have no significant impact on their product plans.

"I don't even know if there's going to be that much demand," said Enrique Crespo Jr., corporate manager of user computing services at Torrington Co. in Torrington, Conn. "Most companies are still trying to migrate to the 486."

The so-called P5, which was expected to debut in time for Comdex/Fall '92 in November, has already appeared in early silicon versions. Intel decided to delay the chip's introduction in part to make sure it could quickly reach production targets, according to P5 product manager Ron Curry.

Intel wanted to avoid repeating its experience with the I486, which, once introduced, took a year to produce in volume, an Intel spokeswoman said. "When we announce, we want to be sure we can ramp quickly," she explained.

The P5's sedate rollout schedule has the added advantage of stretching the life cycle of Intel's 80386 and 486DX2 chips, sales of which could be cannibalized by a P5 announcement, analysts said. Moreover, rushing into production now would also have the P5 and the DX2 warring for manufacturing lines and "wafer starts," or the

*Continued on page 10*

# IBM ponders PC spin-off

BY CAROL HILDEBRAND
and CHRISTOPHER LINDQUIST
CW STAFF

WHITE PLAINS, N.Y. — IBM executives are close to reaching a decision on whether to break out the Personal Systems Division as a separate subsidiary by mid-September, sources said late last week.

It is unclear, however, whether OS/2 development will be part of the new division. That decision hinges on whether the subsidiary can absorb OS/2's enormous development costs and still remain profitable.

A source close to IBM con-

*Continued on page 10*

# Dilemma: Divide DEC to conquer?

BY KIM S. NASH
CW STAFF

MAYNARD, Mass. — Sweeping cost-control measures designed to save Digital Equipment Corp. $1 billion during the next 12 months will likely mean fewer new products, less support personnel and a new way for DEC to do business with its users.

What will be spared, as if there was ever any doubt, is DEC's new Alpha line, company officials said last week while explaining a $188 million fourth-quarter loss and a $1.5 billion restructuring charge.

Among the first issues facing Robert Palmer, who will assume DEC's helm in October, is whether to answer analysts' calls to divide DEC into product-specific units, a la IBM's December reorganization. Such a move could mean that users who have dealt with DEC as a single entity for products from workstations on up will have a few different offices to make friends with in the future.

Company officials indicated last week that spinning off operations into discrete units is indeed in the cards. They offered

*Continued on page 14*

### Bang for the buck

*DEC needs to raise employee productivity if it is to regain profitability*

Revenue per employee

| | |
|---|---|
| **DG** | $146,000 |
| **DEC** | $122,000 |
| **IBM** | $188,000 |
| **Microsoft** | $266,000 |
| **Stratus** | $180,000 |
| **Unisys** | $144,000 |
| **Wang** | $155,000 |

Based on figures reported for most recent fiscal year.

Source: Company reports

# Windows leads Delta to mixed platforms

*Reservation system may need more than OS/2*

BY ROSEMARY HAMILTON
CW STAFF

ATLANTA — Delta Air Lines last week revealed that it is shifting from a primarily IBM OS/2 desktop strategy to one that calls for a mix of operating environments, including Microsoft Corp.'s Windows.

The company is close to selecting Windows to replace OS/2 as the environment for its critical, next-generation reservation system, said Ron Eubanks, director of communications and information services support. A final decision has not been made, but "as we tested [OS/2] against Windows, we determined Windows is the better product to use" for this project, he said.

The new reservation system, perhaps the most critical airline operation, is mainframe-based and will be tailored to include intelligent front-end workstations for reservation agents. It will initially be used by 900 agents.

Eubanks said he expects the project to take 12 months. He would not reveal the development cost.

In December 1991, the airline had selected OS/2 for this job as well as for another key project. At that time, the company planned to buy thousands of OS/2 licenses. While Delta does not intend to pull the plug on OS/2 completely, it has decided not to rely on the IBM software as exclusively, Eubanks said.

The company's reservation system programmers want to move forward with the Microsoft software because it is "functionally and speedwise" superior to OS/2, he said.

"The programming folks say, 'Hands down, Windows is the best for this particular environment,' " Eubanks added.

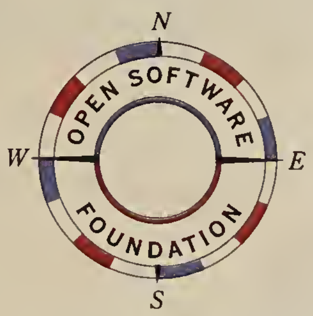
He said this change reflects a new approach at Delta to avoid locking into a particular platform. The goal now is to evaluate software for development proj-

*Continued on page 15*

MIDCOURSE CORRECTION

# Political mine field could sabotage OSF future plans

BY MARYFRAN JOHNSON
CW STAFF



*Second of a two-part series on the Open Software Foundation.*

CAMBRIDGE, Mass. — Admirers call it the United Nations of the computer industry. Critics call it the Tower of Babel.

Yet whenever the Open Software Foundation makes a move, it has the potential to affect the cutthroat competition among the six major systems vendors that sponsor its work. It can also send ripples through the individual agendas of its 340 member companies.

"It is a political mine field," said Mike Saranga, president of the OSF's board of directors and IBM's assistant general manager of systems, structures and management. "We are very aggressive competitors. It's not like we are kissing cousins and we just got together for a big shindig."

The reasons that brought the OSF together no longer matter much to users — if, indeed, they ever did.

"There's been quite a bit of confusion over the past few years, and I think that's led to reluctance in embracing open systems," said Mike Prince, information systems director at Burlington Coat Factory in Lebanon, N.H.

On the other hand, Prince said he believes the coalition of pow-

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**Flexible licensing terms** sell Price Waterhouse on software suite. Page 4.

**Coalition** will build insurance claims network to cut soaring health care costs. Page 6.

**Better late than never:** IBM slashes PC price tags by up to 30%. Page 10.

**Objects** collide with relational databases. Page 12.

**Executive Report** — Group(ware) therapy. Page 71.

NEWSPAPER

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**6** In the same vein, a health care consortium is piloting a network that it hopes will cut administrative costs by up to 50%.

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**21** The **Defense Department** opens a Center for Software Reuse Operations.

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### Quotable

*"Forget about the VAX. Don't put any more money into that product line. Get on with open systems, PCs and Unix workstations."*

EDSON DE CASTRO
DATA GENERAL

*On what he would do in Robert Palmer's shoes at DEC. See story page 14.*

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## The 5th Wave

"HOW SHOULD I KNOW WHY THEY TOOK IT OFF THE LIST? MAYBE THERE JUST WEREN'T ENOUGH MEMBERS TO SUPPORT AN 'AIREDALES FOR ELVIS' BULLETIN BOARD."

# EXECUTIVE BRIEFING

■ **Delta Air Lines might put OS/2 on the next plane out of town and instead go with Windows for a major development project — at least for the time being.** The switch comes as Delta begins a revamp of its reservation system. The move still may not augur a corporatewide Windows strategy, however, as the airline struggles to sort out the issues. **Page 1.**

■ **People and organizational concerns, not technology, pose the biggest obstacles to successful groupware implementations.** Although workgroups often require expanded networking capabilities, early adopters and consultants say that getting different individuals and departments to cooperate remains a far bigger challenge. **Page 71.**

■ **After spending tens of millions of dollars** to develop a customer service application, IDS Financial found out what it had created was technically sound but hard to use. Today, IDS and other companies are relying on usability labs to ensure that software works the way users do. **Page 75.**

■ **An unconventional licensing agreement** between Borland and Price Waterhouse gives the accountancy unlimited use of selected applications. **Page 4.**

■ **With the end of the Unix wars,** some people wonder if the OSF has a future. Sponsors say it does, if only because it gets the biggest vendors pulling in the same direction. OSF is now turning its attention to distributed computing technologies. **Pages 1, 50 and 51.**

■ **A health care industry coalition** and a subsidiary of pharmaceuticals giant McKesson Corp. join forces to pit information technology against escalating administration costs. **Page 6.**

■ **IBM has cut price tags on its personal computer family** by up to 30%, but analysts remain convinced that Big Blue needs to reassess its marketing and distribution strategies. **Page 10.**

■ **Charles Feld, the IS chief who helped Frito-Lay** figure out "where every bag of potato chips is," joins Perot Systems to run a new unit. **Page 5.**

■ **Object-oriented and relational databases** may draw closer as vendors bring out links between them. **Page 12.**

■ **Rod Canion, Compaq Computer's founder, resurfaces** with the formation of a business integration consultancy. **Page 5.**

■ **DEC users suggest Robert Palmer,** the company's new chief, pay more attention to marketing and communicating with customers. **Page 14.**

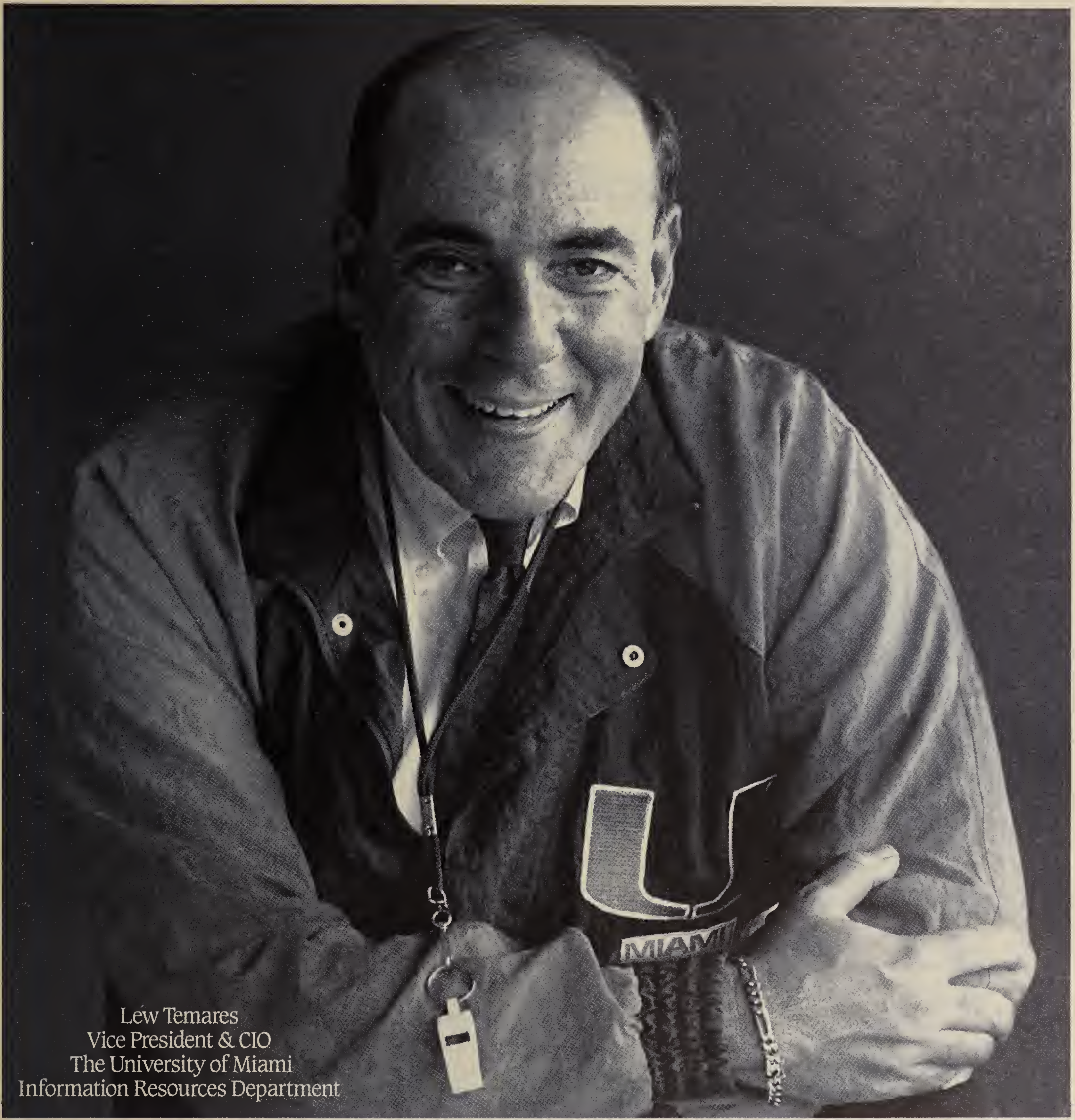
■ **The Department of Defense opens its Center for Software Reuse Operations.** The center provides access to 2.2 million lines of Cobol and Ada code in 1,531 reusable software modules. **Page 21.**

■ **Biometric security devices** and catching on as prices fall, offering computer managers a vast improvement over password protection. **Page 25.**

■ **Network support costs have grown** 20% a year since 1987 and show no signs of slowing as distributed computing makes things messier. **Page 55.**

■ **Windows NT mania isn't transferring** to corporate software development groups just yet. Some users say they'll wait till the operating systems wars are settled. **Page 67.**

■ **On site this week:** Notebook computers help New York Life agents close the deal in the customer's living room. **Page 45.** A Virginia utility gets creative in holding down imaging costs, using fax machines instead of computers to deliver documents. **Page 63.** Maintenance and license fees drive a club operator's move from Unisys mainframes to Sun Microsystems servers. **Page 64.**



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# Borland offers twist on licensing fees

BY CHRISTOPHER LINDQUIST
and ROSEMARY HAMILTON
CW STAFF

In a move likely to intensify the already cutthroat competition among personal computer developers vying for corporate business, Borland International, Inc. last week announced a package deal that gives Price Waterhouse some 25,000 licenses for each of four Borland products.

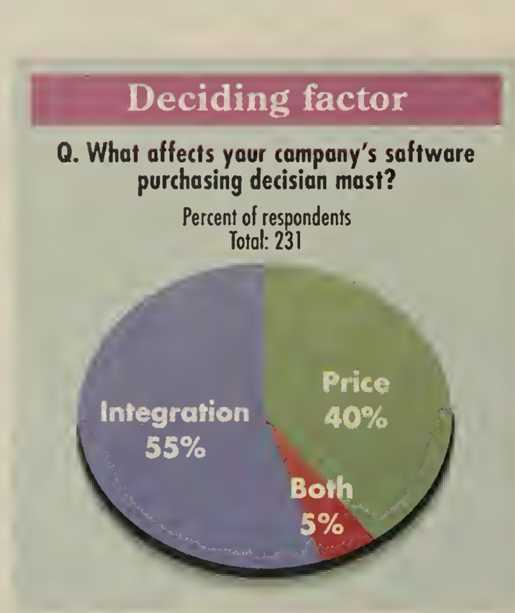
The pact features a licensing agreement based on hardware equipment and unlimited use of selected applications. Price Waterhouse will pay a set fee — which one analyst estimated at around $50 per package — to run Borland software on all computers at the company as well as an undisclosed license fee for each additional computer the company buys in the future, according to Sheldon Laube, national director of international technology at Price Waterhouse.

The company will then have the right to install any or all of the four packages — ObjectVision, dBase, Quattro Pro and Paradox — on its machines.

Neither Price Waterhouse nor Borland would comment on the fee schedule.

In addition, Price Waterhouse signed a multiyear maintenance agreement that gives it access to all future upgrades.

The contract no doubt stings Lotus Development Corp., which has a long history with Price Waterhouse and a fierce rivalry with Borland. In addition to being a showcase account for Lotus' Notes — one of the first — Price Waterhouse is a 1-2-3 customer.



Source: CW Database Division CW Chart: Michael Siggins

The deal effectively eliminates the headache of keeping track not only of the number of computers the financial services firm has but also the number of Borland licenses in use, who has them and where. Now, a single number will suffice.

"We needed a whole new way of doing licensing," Laube said.

At issue was the necessity of some users to use a package on an infrequent basis. Under the old system, the user would have to buy a licensed copy of the product and install it on his computer to remain legal. Now, the same user can simply copy the product from another user. Until the Borland arrangement, "there was no reasonable way of doing that," Laube said.

"Borland has shown an aggressive willingness to throw out the old rules on licensing from the beginning of the company," Laube added.

Borland's history has been strewn with innovative approaches to software licensing and marketing, including the No-Nonsense License Statement, which says Borland software should be treated like a book with no more than one user at a time per license, and the competitive upgrade strategy now used by most large PC vendors.

"Borland loves to upset the status quo and challenge the system," said Stuart Woodring, director of software strategies research at Forrester Research, Inc. in Cambridge, Mass.

Several analysts indicated that such deals have been struck with large buyers on many occasions in the past, but what differs in this case is that Borland is a much smaller company than previous vendors, and it is making a point of publicizing the sale — something other companies have been careful to avoid in order to prevent a price war.

"Nobody wants the real large-volume, funky price deals to come to light, but they're out there," Woodring added. However, Borland seems willing to open the shades.

"Large-scale guerrilla warfare" is how Jim Geisman, president of Marketshare, Inc. in Wayland, Mass., described the move. However, he said, it remains to be seen how many similar purchases the deal will provoke. "This does put a mark on the wall, but how many people will reach up and touch it?"

## Shakin' things up

Borland has reorganized into four business units to "reflect the realities of the marketplace," which include the company's inability to get its Windows products out the door, according to a spokeswoman.

Borland's four business units are Paradox and the Paradox Engine, Applications (including Quattro Pro), Languages and Development Tools (dBase and ObjectVision, among others) and InterBase and Workgroup.

Previously, Borland was divided into three groups: InterBase, Applications and Languages. The reshuffling, which was disclosed days after Borland reported a significant second-quarter earnings decline (see story page 97), creates smaller, more focused groups aimed at specific markets, according to a Borland spokeswoman.

"This [reorganization] may well be a near-term response to get the suckers out the door," said Neal Hill, a senior analyst at Forrester Research. "This puts things back in the hands of people who know them the best — [Rob] Dickerson with Paradox and [Steve] Kahn with Quattro Pro."

A tighter focus may be just what Borland needs at the moment as it begins to get late Microsoft Corp. Windows products moving and starts developing workgroup applications around its Interbase Engine in an attempt to present a unified strategy for corporate software buyers. However, while the reorganization may help stabilize the company, it also indicates that some problems did exist. "This is going to call into question the degree to which this is a stable $500 million company," Hill said. "They're casting about trying to find the right formula."

CHRISTOPHER LINDQUIST and MARK HALPER

# Microsoft, UB form client/server duo

BY JOANIE M. WEXLER
CW STAFF

REDMOND, Wash. — Ungermann-Bass, Inc.'s (UB) anointment last week as a Microsoft Corp. strategic integrator could give Microsoft customers an in-the-know expert to help them forge ahead with client/server computing.

UB has long been a LAN Manager and SQL Server reseller; its newly elevated status interlocks Microsoft operating systems, client/server technology and training and support with UB's large-scale network integration expertise.

The deal is also aimed at fueling UB's enigmatic server-in-a-hub concept — a scheme that both Microsoft and Novell, Inc. have committed to support — for integrated, centralized server management. The agreement assures customers already considering bundling Microsoft operating systems into their hubs that the UB platform will also support future Microsoft technology.

The strategy has drawn supporters and skeptics alike. Some lauded the merits of blending computing and communications management under one umbrella; others were uneasy with servers residing in an inaccessible, locked wiring closet that is tended by cabling personnel.

Even UB hub customer Microsoft is "on the fence" about whether it will be beneficial in its network, said Dave Leinweber, Microsoft's senior manager of corporate networking.

However, the fortified Microsoft/UB relationship should give Microsoft customers somewhere to turn for help with constructing and administering heterogeneous, distributed networking infrastructures that will carry Microsoft's LAN Manager, SQL Server, Windows New Technology (NT) and LAN Manager for Windows NT network applications.

Users shifting to widely distributed enterprises are facing dilemmas with decentralized administration and support, which will "have to be addressed in any changes we make to our network," said Michael Purcell, staff software engineer at LAN Manager shop Baxter Healthcare Corp., based in Deerfield, Ill.

The Baxter network currently consists largely of stand-alone local-area networks, which the firm is looking to interconnect.

### Fixing the glitches

In blending the network application and transport worlds, "a number of issues can come up," UB President Ralph Ungermann explained. For example, he said, an organization running many different kinds of printers might need help in getting LAN Manager applications to interoperate with all of them.

Microsoft's internal network has itself benefited from some UB integration services. For example, Microsoft runs a UB-designed version of the XNS communications protocol that has been specifically optimized for use with the network operating system, Leinweber said.

Microsoft also has integrator alliances with Digital Equipment Corp. and other firms, although the software giant "doesn't have this type of relationship with any other hub vendor," said Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass. Moreover, hubs are becoming cornerstone devices on which many corporate networks are being founded.

Other hub companies, such as market leader Cabletron Systems, Inc., are taking on integrator roles, although most are serving more as a single sales source for network equipment than as an integrator of applications and networks. However, hub maker Networth, Inc., which is half-owned by UB, has a close-knit relationship with Novell that is akin to the Microsoft/UB alliance and thus provides UB inroads into the two largest LAN installed bases.

## On the table

*Companies implementing client/server computing via LAN Manager are the primary beneficiaries of the Microsoft/Ungermann-Bass alliance, which includes the following characteristics:*

- Current and future Microsoft operating systems, client/server technology and training and support to partner with UB's large-scale network integration expertise and support.
- UB to distribute future LAN Manager and Windows NT products.
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# Frito's Feld joins Perot Systems

*Former IS chief will run business unit to help companies use information*

BY MARK HALPER
CW STAFF

HERNDON, Va. — The information systems chief who helped Frito-Lay, Inc. figure out "where every bag of potato chips is" joined Perot Systems Corp. last week to run a new unit charged with helping businesses exploit information.

Charles Feld, who is credited with transforming Frito-Lay's IS group into a strategic operation that uses sophisticated databases to track product and detect regional consumer patterns, was named vice president. He will report to Perot President Pat Horner.

Feld, who served as vice president of management information at Frito-Lay, left the Dallas-based snack food maker earlier this year to form his own consulting group, the Feld Group, which Perot has absorbed. Financial terms were not disclosed.

Perot Chairman Mort Meyerson said Feld will help form a new group within the company that will aid businesses in implementing the types of changes that Feld brought to Frito-Lay.

**Perot's Feld** *put in charge of 'urban renewal'*

**Lessons learned**

Under Feld's tutelage, Frito-Lay implemented relational database management systems that enabled it to keep a tight control on inventory and to map out regional business plans, altering promotions and brand names to suit different market preferences.

"You can take your computing power and use it for marketing and distribution, which is what Charlie did at Frito," Meyerson said.

Feld last week described his mission as "urban renewal," noting that corporations need to move away from mainframe computing toward more distributed client/server technology.

"They have to start knocking buildings down and putting new ones up," Feld said.

## Canion forms consultancy

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Joseph R. "Rod" Canion, former Compaq Computer Corp. co-founder and chief executive officer, resurfaced last week with the formation of a business integration consultancy.

Speaking at a press briefing, Canion said Insource Management Group will help businesses regain their competitive edge, or what he calls "business fitness." He said its mission is to help clients rethink and redesign how they operate by integrating their business strategy and processes with information systems.

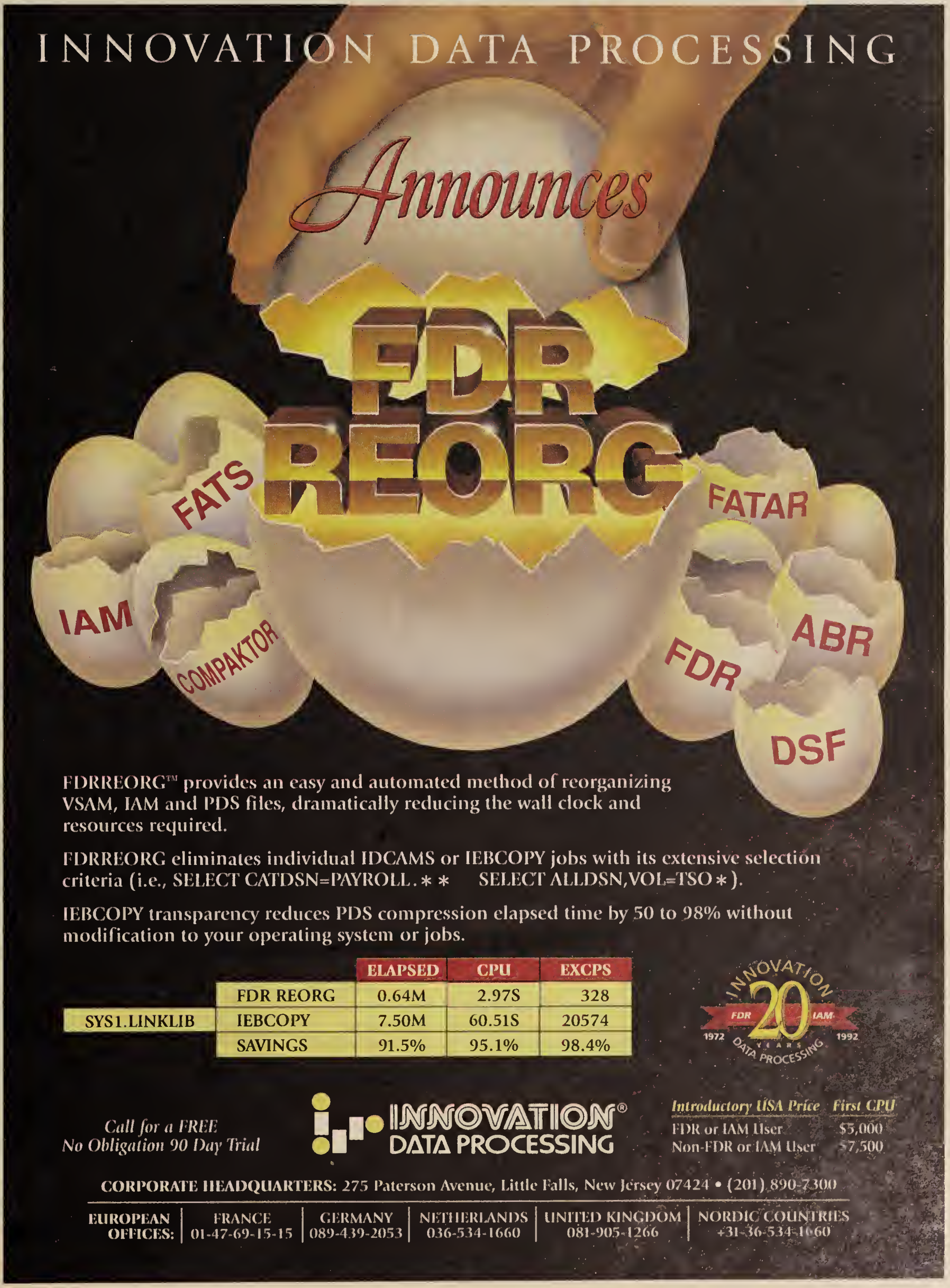
Funded by a $1 million investment — split by Canion and Compaq co-founder James Harris — the company will compete with outsourcing giants such as Electronic Data Systems Corp. and Andersen Consulting.

According to Canion, Insource Management hopes to build long-term client relationships that involve the following three phases:

- First, a team of client and Insource Management staff evaluates the business processes to ensure that they tie in to the company's overall vision.
- Second, the new processes are implemented using appropriate technology.
- Third, the client is trained to manage the new environment and keep abreast of change.

As chairman, Canion carries with him the experience of guiding Compaq through its tumultuous growth years and of being ousted from that same company when he failed to react quickly enough to a rapidly changing market.

President and CEO of Insource Management is Ronald L. Fischer, an EDS executive who was most recently general manager of Perot Systems Corp., a systems integration company headed by Ross Perot. Harris is the final member of the new company's board. The firm has about 10 employess.



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# NEWS SHORTS

### Job stress, keyboard woes linked

A federal study of 533 telephone operators at US West confirmed a link between job stress and the epidemic of hand, wrist, arm and neck injuries from intensive keyboard work. The National Institute for Occupational Safety and Health said 22% of the workers had medically verified injuries. The injuries cropped up mostly among those who feared losing their jobs, faced increased work loads, lacked job diversity and authority and were subjected to electronic performance monitoring.

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### D&B to shutter Amaps help center

Dun & Bradstreet Software plans to close a service and support facility in Eagan, Minn., used by companies running Amaps, a mainframe-based manufacturing application. Service functions performed by the 70-member staff will be transferred to an Atlanta office by December, a spokesman said. Approximately 10 workers will be offered positions in Atlanta or at D&B Software's Framingham, Mass., office. The others will be offered severance, he added. The move will save the firm an undisclosed amount of money, but it is part of an effort to deemphasize resources spent on building host-based software in favor of client/server applications, he said.

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### Object DBMS heart of repository

Versant Object Technology Corp. in Menlo Park, Calif., said last week that its Versant object database management system was the product being used by IBM as the foundation for its AD/Cycle Repository for personal computers running OS/2 and RISC System/6000 workstations running AIX [CW, July 20]. Previously, only MVS systems with IBM's DB2 relational database hosted the Repository Manager. Earlier this year, IBM and Versant had agreed to use the Versant database for IBM's AIX computer-aided software engineering framework offering, said David Gilmour, executive vice president of marketing at Versant.

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### Unisys wins Ferro outsourcing pact

Unisys Corp. announced last week that it has won a $13 million outsourcing contract with Ferro AB of Sweden, a group of companies that supply professional and consumer hardware goods. Under the five-year deal, Unisys will buy back and operate Unisys computers at the customer site in Alingsas, Sweden. Unisys also will repurchase three of its 2200/400 mainframe computers from Ferro and hire Ferro's information systems staff during a 60-day transition period, which began this month. Ferro will retain its in-house software development staff. Ferro estimated the outsourcing pact will save between $3.3 million and $4.9 million over five years.

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### EDS extends pact with Enron

Electronic Data Systems Corp. last week signed a three-year outsourcing contract extension with Enron Corp. and also took a 3% stake in the company. The new agreement prolongs the original 1989 contract through 2001 and adds roughly $180 million to the value. Analysts have estimated the size of the original 10-year deal at about $750 million. EDS spent $149.5 million for 3.5 million shares in the $13.5 billion Houston-based natural gas and oil company.

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### Short takes

Recapitalization discussions among **Encore Computer Corp.**, **Gould, Inc.**, and Gould's Japanese parent, **Nippon Mining Co.**, aimed at an equity infusion for Encore continued last week. . . . **IBM** Senior Vice President David McKinney, a 36-year veteran, will retire from the firm as of Friday. . . . Greg Carroll, executive director at Washington, D.C.-based **The Computer Leasing & Remarketing Association** (CDLA), will officially step up to the CDLA presidency as of this Saturday. He succeeds Kenneth A. Bouldin. . . . Frank King, former **Lotus Development Corp.** executive, has surfaced as a member of the board of directors at **Excalibur Technologies Corp.**, a maker of document imaging systems.

*More news shorts on page 16*

# Team fights rising medical costs

## *Will build on-line system that could cut administrative expenses by 50%*

BY NELL MARGOLIS
CW STAFF

A health care industry coalition and an information technology subsidiary of $10.3 billion pharmaceuticals giant McKesson Corp. last week joined forces to pit information technology against escalating health care administration costs.

The Health Care Information Network (HCIN), expected to debut by mid-1993 after a several-month pilot program, weds the National Electronic Information Corp.'s (NEIC) vast insurance claims network to prescription drug management software developed by McKesson subsidiary PCS, Inc. The partnership creates a real-time, on-line system for routing a broad slate of managed health care transactions nationwide.

The network will "virtually eliminate paperwork and phone calls" between health care providers, customers and product vendors, claimed Kenneth J. O'Donnell, chief executive officer at NEIC, a Secaucus, N.J.-based managed care professional consortium.

NEIC's 330-vendor member network serves 100,000-plus provider subscribers to account for the health insurance coverage of 85 million people in the U.S.

Health care administrative costs have spiraled to an estimated $80 billion a year, said Joseph T. Brophy, president of The Travelers Insurance Co. in Hartford, Conn., an NEIC member and longtime activist in the health care technology arena. HCIN could reduce that figure by as much as 50%, he added.

HCIN "is a truly significant step" in the battle to control health care costs, said Brophy, who is also co-chairman of the industry's Workgroup for Electronic Data Interchange (WEDI), which last week called for nationwide adoption of the ANSI X12 electronic data interchange standard for insurance claims and billing by 1996 (see story below).

### Software to the rescue

"For 10 years, NEIC has been in the business of moving claims" across its public utility network, said Gerald Marrinan, vice president of group health at NEIC member Metropolitan Life Insurance Co. "Now, with the PCS software, it will also be able to move other managed care information — for instance, eligibility requirements, authorizations and referrals."

Brophy said not to discount HCIN's importance on the basis of its restriction to administrative rather than clinical issues.

"Just eliminating postage could reduce health care costs by $4 billion to $10 billion a year," he said. "Electronic [claims] submission could save $20 billion, $30 billion, $40 billion a year, easily."

"Hassle-free," instantaneous transmission of vital claims, patient eligibility, treatment authorization and referral information, O'Donnell said, will wipe out costly and sometimes dangerous delays and omissions.

The network bears no guarantee that the dramatic cost savings will be passed along to patients, several executives involved with the HCIN inititiative said. However, they said, such trickling down is expected.

Phoenix-based prescription drug payment manager PCS won the hotly contested bid to be NEIC's technology partner on the HCIN project, beating out Electronic Data Systems Corp. and IBM subsidiary Integrated Systems Solutions Corp. largely on the strength of technology and timing, O'Donnell said.

"EDS is a very large and powerful company [with a] great deal of health care expertise," he said. "So is IBM. But PCS had an on-line, real-time network [tailored to] the pharmacy marketplace, up and running. There was simply less to develop."

Some 52,000 U.S. pharmacies (approximately 94% of the market) are linked across PCS' Recap network, a 24-hour, seven-day system with extensive emergency backup and storage, McKesson and NEIC said.

# Health care leaders boost campaign for EDI

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Leaders of the health care industry last week launched an aggressive campaign to cut $4 billion to $10 billion in paperwork and administrative costs by using electronic data interchange (EDI) and uniform data elements.

The sweeping recommendations, made by an industry task force and supported by the federal government, call for nationwide adoption of the ANSI X12 EDI standard for insurance claims and billing by 1996.

"We're going to have one standard to replace more than 400 different computer formats," said Joseph T. Brophy, president of The Travelers Insurance Co. in Hartford, Conn., and co-chairman of the industry's Workgroup for Electronic Data Interchange.

**Travelers' Brophy:** *One standard will replace 400 computer formats*

The task force report urges the big players in the industry — such as Medicare, major private insurers and employer plans, hospitals and large clinics — to use EDI by the fourth quarter of 1994, while smaller firms and doctors' offices are given until 1996.

Analysts said the challenge is to get the nation's 6,000 hospitals and 600,000 physicians on board and to figure out who will pay for the transition from proprietary systems to X12 systems.

John Glaser, vice president of information systems at Brigham and Women's Hospital in Boston, praised the initiative, especially the insurance industry's effort to settle on a uniform set of data elements.

"It's a real pain for us to keep track of a couple dozen health insurance formats," he said.

### Full compliance

Glaser said hospitals can migrate to X12 as fast as third-party vendors upgrade their software packages. But, he said it may take a legislative fiat to get 100% compliance throughout the health care industry.

Those hospitals that already use EDI have reduced the turnaround time for submitting claims and receiving payments from an average of 80 days to just two or three days, according to researchers at Input, Inc. in Mountain View, Calif.

The EDI intiative has widespread support in the health care industry, including the national Blue Cross/Blue Shield Association, the American Hospital Association and the American Medical Association.

WHAT HAVE
BILL GATES,
SCOTT MCNEALY,
JOHN SCULLEY,
JOHN YOUNG
AND LARRY ELLISON
AGREED TO
COOPERATE ON?

# Regional banks form ATM network

*Electronic Payment Services, Inc. will link 1,400 banks with 13,000 ATMs in 16 states*

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Four of the biggest U.S. regional banking companies last week signed a definitive agreement to form one of the largest electronic payment and automated teller machine (ATM) networks in the country.

The cooperative venture — which will link the ATMs and point-of-sale (POS) networks of CoreStates Financial Corp., PNC Financial Corp., Banc One Corp. and Society Corp. — is expected to help the member banks reduce their operating costs significantly through the joint sharing of technology. No estimates are available yet on the anticipated savings, although the cooperative is expected to have annual revenue exceeding $200 million with approximately 600 employees.

The venture, Electronic Payment Services, Inc. (EPS), will be finalized in November, pending approval by the Federal Reserve Board. The banks are planning to link their networks together "sometime in 1993," a spokesman for Society said.

EPS will initially represent 1,400 financial institutions with 13,000 ATMs in 16 states, although most of the ATMs are located in Pennsylvania and the Ohio Valley. The company, which will be based in Delaware, will be the largest processor of ATM transactions in the U.S., processing an estimated 1 billion transactions per year.

That includes roughly 20% of the national switch volume, or 730 million "switch" transactions, which occur when customers use ATMs other than the ones owned by the bank that issued their ATM card. There are roughly 90,000 ATMs across the U.S., which process about 6.6 billion transactions annually. In addition, EPS is expected to process more than 650 million electronic POS transactions annually through 150,000 POS terminals used by retailers nationwide.

### Banking on an idea

Diogo Teixeira, a partner at Ernst & Young in Boston, said the deal is significant in the banking industry because this is the first venture involving four major regional banking companies.

EPS solves major strategic problems for its founders, particularly CoreStates, Teixeira said. CoreStates was the sole owner of the Money Access Service, Inc. (MAS) network, which, although profitable, had trouble expanding because other banks were reluctant to join a network of only one bank.

However, the integration of these wholly owned ATM networks should enable CoreStates and its partners to dramatically reduce their operating costs, Teixeira said, especially because switching software no longer has to be duplicated.

Strong POS growth will also aid EPS' future, Teixeira said. Retailers have recently begun using POS terminals that accept plastic ATM cards at checkout counters for debit payments in addition to cash, credit cards and checks.

Although the use of ATM cards to automatically deduct purchases from a consumer's bank account is more common in the Western states than on the East Coast, Teixeira said, its adoption by retailers in the East is expected to grow. In fact, the New York Cash Exchange (NYCE) Network has grown to 8,800 POS terminals from only 1,400 last year, said Joan Savarese, vice president of marketing at the NYCE Network.

NYCE Network was formed a few years ago by The Chase Manhattan Bank NA and Chemical Banking Corp., but that venture included nine owners and dozens of smaller partners who are part-owners, Teixeira said. NYCE annually processes 840 million transactions over 10,000 ATMs.

### Regional contributions

Savarese said the EPS alliance will not directly impact NYCE because NYCE primarily consists of banks and ATMs in New York and New England.

Philadelphia-based CoreStates will be the leading investor, contributing its MAS ATM network and its wholly owned subsidiary, Buypass Corp., an Atlanta-based processor of electronic POS transactions. Banc One, based in Columbus, Ohio, will contribute its Jubilee ATM network and its POS business. Pittsburgh-based PNC will add its Trinet ATM network, its Owl ATM network and its POS business while Cleveland-based Society will integrate its Green Machine Network Corp. and its POS business.

PNC, CoreStates and Banc One will each own a 31% stake in EPS, while Society will own 7%. CoreStates will receive a cash payment of $78 million from PNC and Banc One, $245 million in preferred stock and dividends tied to the earnings of the new company. With those payments, CoreStates expects to turn a $23 million profit while increasing capital by $100 million.

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# IBM (finally) cuts PC prices

*Lower tags a start, but Big Blue needs to reassess marketing, distribution*

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — IBM finally joined the throng of personal computer vendors responding to Compaq Computer Corp.'s inflammatory pricing flag, but analysts cautioned that the industry giant will also have to provide new product lines and explore different distribution approaches to retain market share.

"I don't think price is enough," said Sam Albert, president of Sam Albert Associates in Scarsdale, N.Y. "It's a very vital statistic, but there are other critical success factors like distribution, marketing and support."

Peter Reilly, director of Personal Systems marketing at IBM's National Distribution Division, acknowledged that the firm has a ways to go. While saying that the 25% to 30% price cuts, coupled with the company's 486SLC2 upgrade offer of $259, bring the firm up to par with Compaq, he noted, "We can't cover three product lines with one. We clearly have some holes in our product lines."

**Pros and cons**

Some users applauded the pricing moves. Joe King, assistant vice president of client support services at Continental Insurance Co. in Neptune, N.J., said that between the discounts he gets from his dealer and the ones he gets from IBM, the price cuts put the IBM boxes in a very competitive price range.

His firm is standardized on the Personal System/2 Models 56 and 57, "and with the combination of those two discounts, the 56 and 57 boxes are very competitive with Compaq offerings," he said.

King also lauded the 8M bytes of random-access memory now standard on those PCs. "We were expecting a low-cost upgrade, and they made it free; it's very good news," he said.

However, the price cuts came too late for other users. Enrique Crespo Jr., manager of user computing services at Torrington Co. in Torrington, Conn., explained, "By the time IBM brought prices down to our level, we had a whole population of other machines. We don't want to start out with new hardware." He cited investments in maintenance, training and spare parts as factors.

IBM has other plans, but Reilly did not comment on the reported September launch of an entry-level product line. "We need to have a brand of products that are more industry-standard," he said, agreeing that the XT/AT bus would be an industry standard. "Clearly, there is work yet to be done."

He also acknowledged that the company has a long row to hoe in broadening its distribution lines. Although he swore allegiance to the dealer channel, he said the company would expand. "Our stated strategy is to get into enough distribution channels to satisfy all segments, and we're not there yet," he said.

Reilly said the company was about to ship its first mail-order catalog, and IBM customers would eventually be able to order PCs via an 800 number. The company is currently piloting such a number with OS/2. However, he denied reports that the non-IBM brand name Ambra PC series — currently available in Europe, Canada and the UK — would be available in the U.S.

## Playing leapfrog

As IBM slashed prices across its PC line, Advanced Logic Research, Inc. (ALR) lopped 22% to 33% off its line of Intel Corp. I486-based Ranger notebooks, which hit the shelves a scant six months ago.

"We want to make a stance in the high-end notebook business," said David Kirkey, ALR's vice president of marketing. "We think we entered the market with what prices are going to be six months down the road."

ALR typically offers one of the lowest prices on 486 products and is betting its notebook strategy on the 486 platform.

The price of a monochrome 25-MHz 486 system with a 60M-byte hard drive was cut 32%, to $2,495. A similarly configured color notebook was reduced 22%, to $3,495. Kirkey said a 486DX/25 notebook, priced at $2,995, was 27% less than a comparable Toshiba America Information Systems, Inc. T4400 DX configuration, which is priced at $4,098.

CAROL HILDEBRAND

### A little off the top

*IBM aggressively cut the prices of its PS/2 line up to 30%. Some examples are:*

| Model | Old Price | New Price | Configuration |
|---|---|---|---|
| 56 SLC-059 | $4,030 | $3,025 | 20-MHz 386SLC; 8M bytes RAM; 2.88M-byte disk drive; 160M-byte hard drive |
| 57 SLC-059 | $4,465 | $3,340 | 20-MHz 386SLC; 8M bytes RAM; 2.88M-byte disk drive; 160M-byte hard drive |
| 95 SX-0HF | $11,295 | $8,915 | 25-MHz 486SX; 8M bytes RAM; 1.44M-byte disk drive; 400M-byte hard drive |
| N51 SLC-025 | $3,145 | $2,265 | 16-MHz 386SLC; 2M bytes RAM; 1.44M-byte disk drive; 80M-byte hard drive |

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# P5 chip delay does not vex Intel users

CONTINUED FROM PAGE 1

basic chip building blocks, the spokeswoman explained.

"I think the market is doing very well with 486DX2, so there's not a pressing need for a new chip," said Michael Slater, editor of "The Microprocessor Report," a Sebastopol, Calif.-based newsletter. "Having accomplished the strategy of convincing the industry that they will have something that will compete with high-end [RISC] chips, they can take a leisurely pace and make sure that they have it all right."

While most personal computer vendors would not comment on the delay, few seemed perturbed. Intel's spokeswoman confirmed that numerous vendors would demonstrate their P5 wares at Comdex.

Another advantage to waiting is continued debugging. Dean McCarron, director of technology at Scottsdale, Ariz.-based In-Stat, Inc., added that with such a complex chip, it is difficult to get the early test runs to yield an acceptable ratio of good chips. "With a bigger processor, there's more room for mistakes," he explained.

Users and analysts both said it would be worth waiting a couple of months to avoid a debacle like the 486/50-MHz debut, where several vendors shipped PCs before discovering bugs in the chip.

"We'd be happier to see them go through all their quality-control measures first than have it a couple of months earlier," said Bill Lodge, a project leader at Turner Corp. in New York. Lodge, whose company moved off mainframes to a networked PC environment, got caught in the crunch caused by the 50-MHz 486 chip, which had some heat dissipation problems.

Others, only now moving onto the 486 line, were not especially put out by a several-month delay on a high-end chip.

"I don't think it will have any major impact on us," said Glenn Sandusky, chief information officer at Miller Mason & Dickenson in Chicago. "We don't have any overwhelming need for the 586 right now." He said it might be something to look into in the future as he gets larger clients.

Jeff Newman, assistant vice president at Barclays Bank PLC in New York, said that although he couldn't wait to see a P5-based PC, he plans to wait till the chip goes down in price before buying. The delay "doesn't affect me either way because the PCs will be too high-priced at the beginning," he said. "I now would have to think a dozen times before I spent more than $4,000 on machines."

The P5, which Intel estimated will initially run at about 100 million instructions per second, is the company's first superscalar processor, which essentially means that the chip will be able to perform multiple tasks simultaneously. It has 3.5 million transistors — more than double that of the 486. The chip will run on a reduced instruction set computing (RISC)-based core — an answer to charges that Intel processors could not keep up with high-end RISC chips.

The company revved up the P5 product cycle to quell speculation that RISC chips would outperform the Intel competition, and most analysts said this delay will not affect the mind share Intel has garnered from the move.

"Intel has a $30 million a year market. None of the RISC guys is even close to that," McCarron said. "Intel clearly has reason to be concerned. However, considering [its] current position, they are dominating the market."

Still, competitors such as Cyrix, Inc. and Advanced Micro Devices, Inc. might net some short-term gains from the delay, analysts said.

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# IBM ponders PC spin-off

CONTINUED FROM PAGE 1

firmed that dicussions are under way but said a final decision has not yet been reached.

Operating as a separate subsidiary would rid the division of corporate overhead and enable it to more effectively control marketing, sales and distribution — activities that are currently tied in with mainstream IBM. The subsidiary would most likely be managed by James Cannavino, general manager of IBM's Personal Systems Division.

> "THEY'LL BE building their own bureaucracy. They have to watch their cost structure so things don't get out of hand."
>
> FRANK DZUBECK
> COMMUNICATIONS
> NETWORK ARCHITECTS

Frank Dzubeck, a consultant at Communications Network Architects, Inc. in Washington, D.C., said the move would give Cannavino and others much more leeway in their ability to do things such as moving manufacturing, but negatives do exist. "They'll be building their own bureaucracy. They have to watch their cost structure so things don't get out of hand," Dzubeck said.

"I think they are finally going to compete against the clones, but they've got to shut off all of their overhead," said Steven Fisher, president of Canaan Analytics, Inc. and a 27-year IBM veteran.

Although details of the discussions remain unclear, most observers said they picture the personal computer subsidiary evolving into several operating units within the division: One would sell high-end systems through dealers, and another — a low-end group — would move products through commodity channels such as mail order and superstores.

Gaining sales control brings up the issue of having multiple IBM salesmen banging on the information systems door, but sources said that a great deal of product will be wholesaled back to IBM Sales and Marketing for sales through that channel.

Disclosure of the spin-off is expected as early as mid-September, which could coincide with or slightly precede the launch of IBM's new low-end PC family, slated for a Sept. 22 unveiling, sources said.

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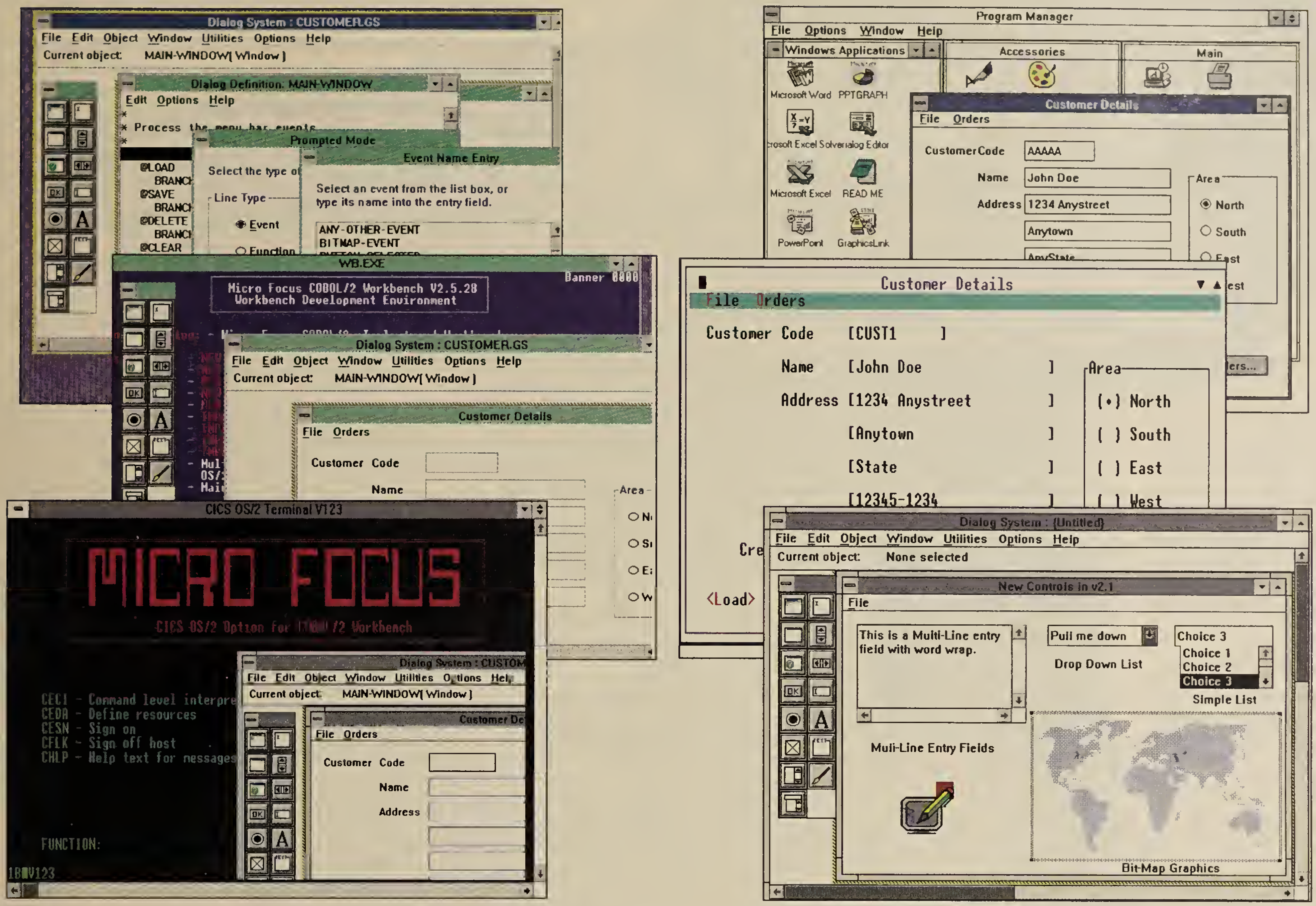
Dialog System : CUSTOMER.GS
File Edit Object Window Utilities Options Help
Current object: MAIN-WINDOW( Window )
Dialog Definition: MAIN-WINDOW
Prompted Mode
Event Name Entry
Select an event from the list box, or type its name into the entry field.
ANY-OTHER-EVENT
BITMAP-EVENT
WB.EXE
Micro Focus COBOL/2 Workbench V2.5.28
Workbench Development Environment
CICS OS/2 Terminal V123
MICRO FOCUS
CICS OS/2 Option For COBOL/2 Workbench
CECI - Command level interpreter
CEDA - Define resources
CESN - Sign on
CFLK - Sign off host
CHLP - Help text for messages
FUNCTION:
Program Manager
Windows Applications
Accessories
Main
Microsoft Word
PPTGRAPH
Microsoft Excel
READ ME
PowerPoint
GraphicsLink
Customer Details
File Orders
Dialog System : (Untitled)
Current object: None selected
New Controls in v2.1
This is a Multi-Line entry field with word wrap.
Pull me down
Drop Down List
Choice 1
Choice 2
Choice 3
Simple List
Muli-Line Entry Fields
Bit-Map Graphics

Customer Details

File Orders

Customer Code [CUST1 ]

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# First links between object, relational databases forged

*Vendors announce partnerships, tools to bridge architectural gaps*

BY JEAN S. BOZMAN
CW STAFF

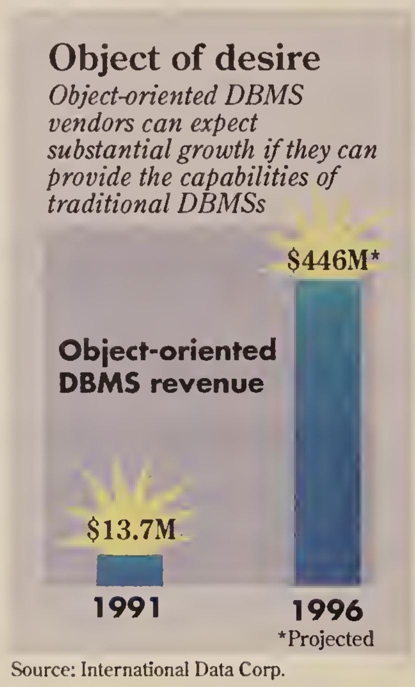
SAN FRANCISCO — Object databases are on a collision·course with relational databases.

Users and vendors at last week's Object World show said the two technologies are destined to meet in the mid-1990s, even though object-oriented databases hold different types of data than relational databases, and the two are architecturally isolated because there have been no interfaces between them. That is about to change, however, as several firms announced links between object-oriented databases and relational systems last week:

- **Hewlett-Packard Co.** in Palo Alto, Calif., said its OpenODB object database, which shipped in December, will be linked to the Informix OnLine relational database from **Informix Software, Inc.** in Menlo Park, Calif.

Under a cross-licensing deal, OpenODB objects will be stored inside the relational database and accessed through HP's Object SQL interface. Informix will also adapt its 4GL++ tool, which has object-oriented extensions, so it can write applications for OpenODB. The OpenODB product already works with HP's AllBase/SQL relational database.

- **Digital Equipment Corp.** announced its own object-oriented database, called DEC Object/DB Version 1.0. The product, which is slated to ship in September, is based on an object-oriented database made by **Objectivity, Inc.** in Menlo Park, Calif. DEC will sell and support Object/DB and provide software tools to create applications that will link the object database to Rdb.



Object of desire

*Object-oriented DBMS vendors can expect substantial growth if they can provide the capabilities of traditional DBMSs*

Source: International Data Corp.

- **Object Design, Inc.** in Burlington, Mass., and **Progress Software Corp.** in Bedford, Mass., signed a joint development and marketing agreement under which Object Design's ObjectStore object-oriented database management system will be linked to the Progress 4GL fourth-generation language, which is used to write relational database applications. Products are scheduled to undergo beta tests in the fourth quarter and ship in the first quarter of 1993.
- **Servio Corp.** started shipping Release 3.0 of its GemStone object database, which contains links to Sybase, Inc.'s SQL Server relational database system. Servio's GeODE development tools are used to construct object-oriented applications.

Industry analysts said such partnerships are inevitable, given the small size of most object-oriented database vendors and the requirement to link object-oriented products to the existing information systems infrastructure. This leaves object database firms with very few choices, said Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Stamford, Conn.

"They are either going to form an alliance with the RDBMS vendors, be bought out by them or go out of business," Feinberg said.

Newcomers to object-oriented systems are drawn to their strongest selling points: reusability of objects, reduced development time and the freedom to associate any two objects without complex indexing schemes. But object databases have existed in a vacuum, set apart by unique data-access methods and special software tools.

If the gap between object databases and relational databases were bridged with similar data-access methods, IS developers could draw on a rich set of data from both database structures for complex applications.

"We see the benefits of using object-oriented technology to build new applications, since our Cobol systems are very old," said Mike Blask, an IS administrator at the Maricopa County Health Services Agency in Phoenix.

But there is a need to share data with departments that have relational databases, Blask said: "We probably would not be able to go to object-oriented technology if those links to older systems didn't exist."

But some users questioned whether the links between object databases and relational databases are really needed, even if they will soon be available. They said the stuff of which object-oriented databases are made — everything from geometric data to multimedia images to engineering drawings — cannot be jammed into the up-and-down, left-and-right rows and columns of relational databases.

"It's like chalk and cheese, to quote an English phrase," said Cecil Bloch, a senior analyst at the Research Libraries Group, Inc. in Mountain View, Calif., which builds library systems with object-oriented software. "Object databases and relational databases are inherently different. The only reason there has to be continuity is that the relational database companies don't want to rebuild everything."

Although partnerships between object-oriented firms and relational database firms are new, they are likely to multiply in coming years. Oracle Corp. is reportedly looking for partners to add object-oriented features to its Oracle 7 database release. The Ask Co.'s Ingres Products Division recently announced a partnership with ESL, Inc. in Sunnyvale, Calif., to store ESL's class library of multidimensional objects inside the Ingres relational database. And industry analysts predicted that HP will soon license OpenODB to other RDBMS vendors.

PARTNERSHIPS ARE inevitable, given the small size of most object-oriented databases vendors and the requirement to link object-oriented products to the existing IS infrastructure.

## Three lessons in objectivity

The leading lights of the personal computer industry traded barbs at last week's Object World over who would incorporate object-oriented features first.

Jim Allchin, Microsoft Corp.'s vice president of advanced systems, joined Borland International, Inc. Chief Executive Officer Philippe Kahn and Next, Inc. CEO Steve Jobs in a three-hour show-and-tell demonstration of object features found in the trio's current and future products.

Microsoft was criticized by Kahn and Jobs for failing to jam enough object-oriented features into the current release of Windows 3.1, never mind the first release of Windows New Technology (NT). Allchin countered that Microsoft's Object Linking and Embedding (OLE) protocol is being enhanced, while the Microsoft Object Manager for handling system resources is hidden in the kernel of NT.

Allchin also claimed Microsoft's object solution would be more cost-effective than Next's. "Steve showed all the things I showed," he said, "but I showed it on PCs."

Kahn had another view of Microsoft's strategy to migrate its installed base to objects. "Today, the only thing object-oriented about OLE is its name," he charged. And, intoning his mantra for object technology, Kahn added: "It has no inheritance, encapsulation or polymorphism." He showed a police report program, built by two San Jose, Calif., police officers with Borland's C++-based ObjectVision. He said his product "surfaced" the object features, allowing users to link spreadsheets and graphs.

Jobs wound up the session by announcing that NextStep 3.0 will ship next month and demonstrating icon-heavy object-oriented applications on a Next computer screen. "We're going to be 60 days late, and I apologize for that," Jobs said, "but at least we have some software to ship."

NextStep 3.0, which runs on Next machines and Intel Corp. I486-based PCs, conforms to the Object Management Group specifications for object-oriented technology, he said.

JEAN S. BOZMAN

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# Oracle updates application packages

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — As expected, Oracle Corp. updated its 4-year-old line of application software packages last week, adding client/server support and graphical user interfaces. The move followed a yearlong rewrite of the applications, which have had quality problems since 1988.

"The customers used to be unhappy because they felt they were being used for quality-assurance testing," said George Koch, senior vice president at Oracle's application division.

Oracle Applications Release 9 is a suite of 23 financial and manufacturing applications and four programming utilities built with the Oracle Applications Object Library, a replacement for the aging Application Foundation tool kit. Programs are now documented in Oracle's CASEDictionary so users can customize the packages. They will be available next year on 30 platforms at prices ranging from $26,000 to $166,000.

### Icon format

A companion product, the Oracle Business Manager, is a personal computer-based "client" that can access all the new applications and present them to end users in an icon-based format.

Previously, Oracle applications were designed for display on character-mode terminals. Users can now store many report formats on the database server, allowing Oracle to support user sites where PCs are used as clients.

Oracle applications users said they were pleased with the enhancements, but several had not been briefed yet. Greg Larson, manager of business systems at Nerco, Inc. in Portland, Ore., said his energy firm plans to use an automatic posting feature for the General Ledger package, which posts updates from the accounts payable package.

Coca-Cola Bottling Co. in New York and Greenwich, Conn., plans to make use of the Oracle Payables package's "invoice import" feature for electronic data interchange applications, said Ronald Drew, manager of systems development.

Industry analysts said Oracle will be able to grow its $49 million applications business but will face tough competition from traditional applications vendors.

"D&B is the biggest player in the Fortune 1,000 applications business, and Oracle's applications business is one-tenth that size," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

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Richard Rogers,
Architect

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

# Olsen's shadow looms large at DEC

BY MELINDA-CAROL BALLOU
and KIM S. NASH
CW STAFF

MAYNARD, Mass. — The impending exit of Digital Equipment Corp.'s founder, Ken Olsen, left longtime users and DEC watchers pensive last week, reflecting on what once was and how Olsen made it that way.

"It's a hell of a legacy: a $14 billion company started from a shoebox, one of the world's foremost operating systems, a staff of talented people and a product set that is pretty good, with the Alpha chip set at the pinnacle," said Jeffrey Jalbert, an executive committee member of the Digital Equipment Computer Users Society.

Observers across the board similarly lauded Olsen for his contributions both to his company and to the industry, which many said would have been vastly different without him.

"When you think about it, if it weren't for Ken Olsen, we'd all be using punch cards still," said Bill Bluestein, a senior analyst at Forrester Research, Inc., a research firm in Cambridge, Mass.

With three other engineers and $70,000 in venture capital, Olsen created DEC in 1957, pulling the firm atop the billion dollar mark 20 years later. As sales crested to $7.6 billion in 1986, *Fortune* called him "arguably the most successful entrepreneur in the history of American business."

But at least 126,000 other people — DEC's head count at its peak this year — helped Olsen achieve those honors and, in a way, helped him decide to leave.

Those who know Olsen said he retired after being pressured to make changes that, while necessary, left a bad taste in his mouth: enormous layoffs.

Olsen had consistently objected to wielding the ax and was largely responsible for a generous early retirement plan this spring, observers said.

Just one day before he announced his resignation [CW, July 20], a troubled Olsen told *Computerworld*, "We've always had to adjust our size, but to say that you're going to lay off 5,000 people [for example] — I hate this way of doing it. I want to take care of people, tell them one-on-one and help them find a job."

## Slow to move

Olsen's reluctance also extended to certain emerging technologies such as personal computers, unshielded twisted-pair cabling and Unix. DEC eventually came around on all counts.

In the case of Unix, Olsen ultimately OK'd the creation of an open version of VMS, DEC's 15-year-old flagship proprietary operating system. He also launched Alpha, a new generation of reduced instruction set computing technology.

Ironically, Alpha machines — widely regarded as DEC's redeemer from financial hell — are due for delivery shortly after Olsen hangs up his chief executive officer's hat at year's end.

When Alpha ships, "DEC may well be a technical leader once again, which has a lot to do with [Olsen's] insight and leadership," said Al Chaby, MIS director at Envirosafe Management Services, Inc. in Valley Forge, Pa. "It's a pity that the financial performance of DEC has been weak because they are in for a resurgence" with Alpha.

# Dilemma: Should DEC divide in order to conquer?

CONTINUED FROM PAGE 1

no definitive plans, but Jack Smith, senior vice president of operations, said the focus is on certain manufacturing and general administration functions.

If DEC is to survive, Palmer must also change the company's reputation for being slow to react to market demands, said Susan McGary, an analyst at The Yankee Group in Boston.

DEC's traditional monolithic structure kept VMS products "nice and coherent top to bottom, but the company was less able to react quickly to changes in the market that way," said Bill Sines, an analyst at Framingham, Mass.-based Technology Investment Strategies Corp.

Still unclear — but expected to be made public within a few weeks — is just how many DEC employees will lose their jobs. Smith said he had "no doomsday numbers" to share regarding the severity of layoffs expected, but he denied that head-count reductions would reach 20,000, a number widely bandied about by analysts.

The company bulldozed its ranks during the past year by 23,000, down to 113,800. That 18% reduction produced about half of the $1 billion annualized spending cut achieved in fiscal 1992, Smith said.

Smith was equally short on specifics about which product lines will be gutted following staffing and funding cutbacks. "We've taken most of the fat out of the system. We'll get the rest out through business process reengineering," he said.

Observers were divided on whether DEC should abandon its second stab at the personal computer business.

However, Smith said the company will push on, despite the meager margins hurting PC veterans such as Compaq Computer Corp. and IBM.

If workers associated with Alpha are safe, so are those in DEC's systems integration group, judging by Smith's remarks. To buffer its hardware strategy, DEC will push hard to promote itself as a service provider, he said. "This is not a 'fix-it' business. Our focus is network management and systems integration," Smith said.

To DEC's credit, service revenue grew 11%, from $5.6 billion last year to $6.2 billion for 1992. "In an inflationary year, that's a good sign," noted John Jones, an analyst at Salomon Brothers, Inc. in San Francisco.

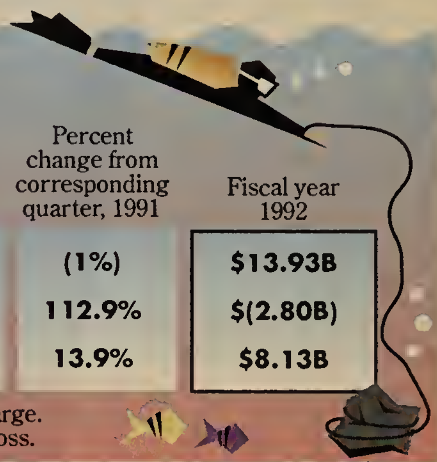
And while Alpha remains DEC's great hope, some users said they are just not yet interested in the systems, which are slated to arrive in early 1993.

"I haven't been real impressed with what I've seen so far — and that's only been on paper anyway," said Jeri Mahoney, a systems specialist at Bridgestone/Firestone Scientific Computing in Akron, Ohio.

*Mid-Atlantic correspondent Thomas Hoffman contributed to this report.*

## DEC dives

*DEC sinks into a red hole in the fourth quarter by $1.86 billion*



| | 4Q 1992 ended June 27 | Percent change from corresponding quarter, 1991 | Fiscal year 1992 |
|---|---|---|---|
| **Revenue** | **$3.91B** | **(1%)** | **$13.93B** |
| **Net loss*** | **$(1.86B)** | **112.9%** | **$(2.80B)** |
| **Cost of sales** | **$2.31B** | **13.9%** | **$8.13B** |

*Includes a $1.5B restructuring charge.
112.9% denotes an increase in net loss.

Source: Digital Equipment Corp.

# The customers speak

None of the users interviewed last week envied the challenge awaiting DEC's new CEO, Robert Palmer, but they had plenty of advice for him — particularly on customer and competitor relationships. Time will tell whether the customer is always right.

**Richard Marx,** *director of information services at Commonwealth Electric Co. in Wareham, Mass.:*

- "DEC marketing is an oxymoron. If Palmer has a better marketing focus than Olsen did, he has a better shot at turning things around for the company."

**Bobby Graves,** *systems manager at Champion International, a paper mill in Courtland, Ala.:*

- "I'd get friendlier with other companies. They're going to have to make friends with other vendors, especially IBM, if they want to survive. Many businesses run both DEC and IBM equipment, and they want to get that stuff talking to each other. "

**Ray Sasso,** *chief information officer at food processing company Simplot Co. in Boise, Idaho:*

- "They really need to polish up sales and marketing." More often than not, Sasso added, the person selling him a product does not understand how it fits in with the rest of his estimated $20 million worth of DEC equipment.

"Do something to elevate the stature of the marketing function within the company," he advised Palmer. "The only people who feel loved at DEC are engineers."

# Walk a mile

*Computerworld* asked industry veterans, some of whom have been through the corporate wringer themselves, what they would do in Robert Palmer's shoes.

**Gordon Bell.** *Now a consultant, Bell oversaw development of DEC's PDP and VAX minicomputer lines and worked at DEC for 17 years.*

- "I'd work like hell to get the company focused on lines of businesses. It was incredibly stupid to announce [Alpha] before they had it available."

**Edson de Castro.** *After spending eight years in DEC's engineering department, de Castro left to co-found Data General Corp. He is a director at a handful of technology firms.*

- "Forget about the VAX. Don't put any more money into that product line. Tell it like it is on Wall Street. Get on with open systems, PCs and Unix workstations."

**John Cunningham.** *Currently serving as director at several computer companies, Cunningham was formerly a top gun at DEC's rival, Wang Laboratories, Inc.*

- "Take out three out of every 10 employees from all departments. You just don't need 112,000 people anywhere — I don't care who you are. Find a way into the PC business. They missed in 1982, but that doesn't mean they can't do it now."

**Frank Dodge.** *Chief executive officer of The Dodge Group, a Framingham, Mass.-based client/server software developer, and co-founder of McCormack & Dodge, now part of Dun & Bradstreet Software.*

- "So many people in that company are overly committed to the VAX that some of them can't let go. Those that can't let go should be sent away — R&D, marketing, sales, everyone. I'd keep people around only to support the VAX line and enhance it."

# Key OS/2 ports slow to arrive

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — In the four months since IBM's release of OS/2 2.0, few major personal computer software vendors have shipped compatible products.

IBM now boasts that 160 companies are shipping OS/2 2.0 applications, including Novell, Inc. and Oracle Corp. But most of the top PC applications providers remain in the verbal commitment phase.

Users contacted last week, however, said they are still so preoccupied with testing and rolling out OS/2 2.0 that they are not yet worried about applications availability. "Most of the majors have 32-bit programs in beta or close to that," said Bob Hecht, vice president of investment systems at Prudential Investment Corp. "You can use most of your DOS and Windows apps under 2.0. But on the other hand, you want [32-bit applications] as an option."

However, Jeff Newman, an assistant vice president at Barclays Bank PLC in New York, said he is still waiting for Microsoft Corp.'s decision on LAN Manager for OS/2, and without that support, his OS/2 2.0 installation will be delayed.

Ruth Warren, a Microsoft senior product manager for LAN Manager, said the company is shipping a client version of LAN Manager with 2.0 support to beta-test sites and forecasts a September ship date. However, the company will not yet commit to a server version of LAN Manager with OS/2 2.0 support because it has concerns about 2.0's "stability."

Other top PC software companies, such as WordPerfect Corp., said they will support OS/2 2.0 but would not say when products would be available.

John Soyring, IBM's Personal Systems director of software development programs, said he is pleased with the progress and pointed out that several top software companies delivered Microsoft Windows 3.0-compatible products more than a year after 3.0's debut.

Borland International, Inc. is shipping ObjectVision for OS/2, but its applications group could provide no specific product plans for 2.0 support. Lotus Development Corp. is committed to releasing its suite of products with OS/2 2.0 support and said its 1-2-3 spreadsheet and Freelance Graphics for 2.0 will ship by year's end.

Also, Microsoft is still holding firm with its strategy not to further enhance OS/2 versions of Excel and Word unless it sees a "sufficient" demand for IBM's 32-bit operating system.

Check out the Marketplace Pages on Page 91.

# Windows leads Delta to mixed platforms

CONTINUED FROM PAGE 1

ects on a case-by-case basis and select the one with the best cost and functionality. Eubanks also acknowledged that a mixed environment brings a new set of problems: making it all work together.

According to Eubanks, development is under way to bridge the OS/2 and Windows environments, but he would not provide details.

"To get context on this, all you have to do is look at the [financial] news," said Brad Power, a principal at CSC Index, Inc. and director of the company's re-engineering research and advisory service. "They, like all airlines, are in trouble financially. If they are looking at technology decisions, then they will look for the lowest cost solution."

Last week, Delta reported a fiscal year 1992 year-end loss of $506.3 million on revenue of $10.8 billion. For the fourth quarter, ended June 30, it reported a loss of $180 million on revenue of $2.8 billion.

Power said the move to a mixed-platform strategy also reflects the corporate culture at Delta, which is known as a more practical operation and less pioneering than some of its competitors.

Delta "has very good operators — the best people — and they make very practical decisions," Power said. "They don't make technically aggressive or risky ones."

Delta will continue to use OS/2 for an airport traffic-management system, according to Eubanks. He said the company will evaluate OS/2 for future projects and has no intention of pulling the plug on it overall.

"We want to do what's best for users, whether it's OS/2, Windows or dumb terminals," Eubanks added.

An IBM spokesman said, "To our knowledge, our relationship with Delta has not changed."

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# NEWS SHORTS

### BSA to protect software copyrights

Six leading software publishers have given the Business Software Alliance (BSA) authority to enforce their copyrights in North America. Aldus Corp., Autodesk, Inc., Lotus Development Corp., Microsoft Corp. and WordPerfect Corp. asked Washington, D.C.-based BSA to begin a domestic antipiracy program similar to the initiatives it has in 30 countries worldwide. A Lotus spokesman indicated that the vendor would pursue all of its litigation through the BSA rather than the Software Publishers Association (SPA), though Lotus will remain an SPA member. The BSA quickly obtained a temporary restraining order against McAllen, Texas-based CompuMart, which is suspected of loading illegally copied software onto computers it was selling in Mexico. The group also established a software piracy hot line at (800) 688-2721.

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### Repeal of Section 1706 debated

The campaign to repeal Section 1706 of the Tax Reform Act of 1976 picked up a little steam last week at a hearing held by the House Ways and Means Committee. Testifying for repeal of the provision, which makes it harder for brokered computer programmers to be classified as independent contractors, were Reps. Doug Barnard Jr. (D-Ga.), Tom Lantos (D-Calif.) and Major R. Owens (D-N.Y.). The Information Technology Association of America said it continues to support Section 1706.

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### SMDS to hit California

Pacific Bell last week filed a Switched Multimegabit Data Service (SMDS) tariff with the California Public Utilities Commission in hopes of making the service available at T1 speeds in the Los Angeles, San Francisco, San Diego and Sacramento service areas come September. Proposed SMDS charges include a $375 installation fee plus $600 per month for unlimited use and distance within the service area. Customers still need a dedicated T1 line to their local central office, however.

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### Air traffic control system demo'd

MCI Communications Corp. demonstrated a prototype of its Leased Interfacility National Air Space Communications System (LINCS), a national data and voice network to support air traffic control. Being developed for the Federal Aviation Administration in a 10-year, $1 billion project, LINCS is based on dual circuits and redundant components and is to have a reliability of 99.999%. It is scheduled for installation in the Northwest in the second quarter of next year.

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### Kit teaches computer ethics

The not-for-profit Research Center on Computing and Society at Southern Connecticut State University and Educational Media Resources, Inc. have assembled a starter kit for teachers who wish to introduce the social and ethical implications of computing into computer science or computer engineering classes. The kit includes three videotapes and two monographs.

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### Short takes

**Bell Atlantic Corp.** appointed Arthur A. Bushkin as its first president of information services at **Bell Atlantic Network Services, Inc.** . . . The **National Urban League**'s Job Opportunity Showcase, a recruiting center for matching minority applicants with jobs open at 200 companies nationwide, is being powered by **Digital Equipment Corp.** gear connecting the league's 114 offices with its headquarters in New York. DEC gave the league a $1.5 million grant four years ago. . . . **Borland International, Inc.** has announced an $800,000 order by **Magnavox** for its InterBase relational database engine. It will be used in Magnavox's **Advanced Field Artillery Tactical Data Systems** contract. . . . **Verbatim Corp.** has said it will offer a lifetime warranty on all of its 3½- and 5¼-in. rewritable optical media. . . . **Emerald Systems Corp.**, **Everex Tape Products** and **Mountain Network Solutions, Inc.** will refer customers to **Computer Conversions, Inc.** for data recovery from damaged backup tapes.

# Motorola E-mail service bows

BY ELLIS BOOKER
CW STAFF

BOYNTON BEACH, Fla. — Motorola, Inc. last week began offering its next-generation pager service for sending electronic mail and other data to portable computer users.

Embarc, short for Electronic Mail Broadcast to A Roaming Computer, is a noninteractive, one-way service that combines satellite transmission and Motorola's own pocket-size NewsStream receiver to deliver wireless E-mail to laptop, notebook and palmtop computers.

According to Brad Davis, director of strategic marketing for Embarc, Motorola envisions a marketplace represented by the "intersection of electronic-mail and portable computer users." That universe currently consists of approximately 6.5 million to 7 million users, according to Davis, who expects to have 50,000 Embarc users within a year.

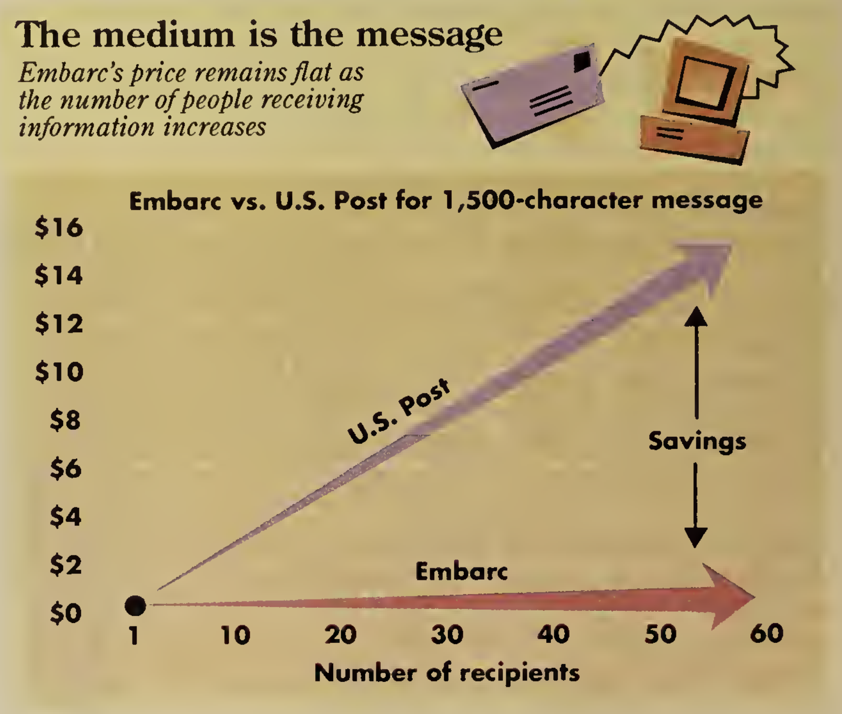
At least one early Embarc beta-test user said he would be hard-pressed to give up the service, which has enabled him to receive important IBM Professional Office System messages while traveling.

"I'm kinda hooked on it," said J. Joe Marsh, manager of communications technology at Shell Oil Co. in Houston. Since January, Marsh and 26 staff members have been testing the service with a variety of laptop, palmtop and pen-based portable computers.

Motorola said last week that it expects its Embarc service to cover the Top 200 U.S. markets by year's end, with plans to expand to 300 markets by 1994 and worldwide coverage during the next five years.

The cost of Embarc includes a onetime $395 charge for the NewsStream pager, "AA" battery, interconnect cable, belt holster and Embarc/DOS user software. The service also carries a basic fee of $15 per month, which includes the delivery of news and weather updates from *USA Today.*

Message senders are charged 13 cents per message, as well as a "wireless stamp" delivery charge ranging from 5 to 50 cents per 100 characters. The fastest speed at which a message can be forwarded to a mobile unit is 15 minutes; the slowest and least expensive rate is for overnight delivery.



**The medium is the message**

*Embarc's price remains flat as the number of people receiving information increases*

Source: Motorola, Inc.

# Export barriers on encryption eased

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Bush administration recently relaxed controls on the export of some software with encryption capabilities, a move vendors said should lead to better security features in mass-market packages.

Companies that were inhibited in putting security features into their products for fear they could not be exported — or because they could not afford to go through the laborious export approval process — said last week they will accelerate plans to add features for encrypting spreadsheets, files and messages.

"Our customers are asking for security, but to date we have not had a lot of security features," said Nathan Myhrvold, vice president of advanced technology and business development at Microsoft Corp. "We are now able to provide it, domestically and internationally."

### No details

Myhrvold would not say when and where encryption features would appear in the Microsoft product line but pointed out, "We've said that the Windows NT operating system will have security features, and we've announced that we will license the RSA encryption technology" from RSA Data Security, Inc. in Redwood City, Calif.

John Winterhalter, manager of information systems at 3M Co.'s Commercial Office Supply Division, said the lack of encryption in most mass-market software is increasingly a problem as companies expand overseas, increase connectivity and move from private to public networks.

"It's critical that we have encryption capabilities. 3M is a global company, and we're running our business on E-mail today. If we and our global partners can't be secure in our communications, we have a big problem," he said.

In a letter to Congress, National Security Adviser Brent Scowcroft said the White House and the Software Publishers Association had developed procedures by which software containing RSA's encryption algorithms with limited encryption key lengths would be effectively freed from export controls.

However, Scowcroft said other encryption methods, such as the federal government's Data Encryption Standard (DES) algorithm, widely used in the banking industry, will continue to be strictly controlled.

### Top secret

While industry has gravitated toward RSA's techniques as a standard — with most major software firms having licensed them — the 15-year-old DES algorithm, which uses a 56-bit key length, provides more security than the algorithms approved for export, which use 40-bit keys.

However, unlike the DES algorithm, RSA's algorithms — called RC2 and RC4 — use a variable key length that can be changed by recompiling software. Myhrvold said he prefers RSA's algorithms because they are much more efficient than DES. He said Microsoft would boost security on products for export by increasing key lengths as allowed by the government.

But Lee Mercer, corporate export manager at Digital Equipment Corp., said the failure to free DES products for export was disappointing and inexplicable because DES is already available from foreign competitors.

DEC offers products based on DES and has licensed RSA technology but does not offer products based on it.

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# Proteon adds low-end router for uninitiated, remote users

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — The plight of the minimally staffed remote field office seeking admittance to the corporate network improved a notch last week with a low-end internetworking announcement from Proteon, Inc.

The shot in the arm arrived in the form of an inexpensive multiprotocol bridge/router that comes largely preconfigured per instructions users check off on an L. L. Bean-like order form.

Proteon's $4,995 to $7,995 DNX 300M addresses companies' economic inability to stock many small, far-flung sites with expertise for supporting complex networking equipment.

The router's ease of use "is amazing — anyone can configure the thing," said Mike Gourley, network administrator at Physicians Mutual Insurance Co. in Omaha.

Gourley said he was initiated into the router world with the Proteon product and installed it in under 10 minutes. "I've heard horror stories from people who have spent three hours configuring other routers and still don't get it quite right," he said.

### Comparing the two

Since Physicians Mutual is a Novell, Inc. shop, Gourley also evaluated Novell's multiprotocol router software. While cost-effective, he said, it was cumbersome and offered a lower throughput.

Matthew Heath, section head of the data communications group at Gulf Stream Aerospace Corp. in Savannah, Ga., also evaluated the Proteon product against the Novell low-end router software he had been previously using. In terms of economics, he countered that "by the time I buy a dedicated PC [for performance], outfit it with LAN cards and buy a keyboard and monitor, the price [of the Novell router] is comparable to Proteon's."

In addition, the Proteon router has "more functionality, more protocol support and higher throughput," he added.

Cable connections of all types, flash memory for remote software loading and reconfiguration, telltale front- and back-panel LEDs and a yes/no step-through configuration menu target remote-site personnel who are minimally interested in the intricacies of networking. The Proteon DNX 300M is due to ship this week.

### Users will beg for more

While analysts agreed that the Proteon rollout is in sync with user needs, users will soon be looking to integrate more function into remote-site devices such as smart wiring hubs for further economies of scale, noted Dave Passmore, a vice president at Stamford, Conn.-based Gartner Group, Inc.

For example, Wellfleet Communications, Inc. routers already allow users to connect a private branch exchange into its router and multiplex voice and data over the same T1 line instead of paying for separate links, he said.

Similarly, Micom Communications Corp. announced in May a device it calls NetRunner, a $3,500-and-up bridge-like product that packs Ethernet local-area networking, IBM Systems Network Architecture and voice and fax transmission on one 56K bit/sec. leased line [CW, May 11].

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# NCR picks image partner

BY ELLIS BOOKER
CW STAFF

DAYTON, Ohio — NCR Corp. last week picked a marketing partner for a check imaging system aimed at the nation's 7,200-plus community banks.

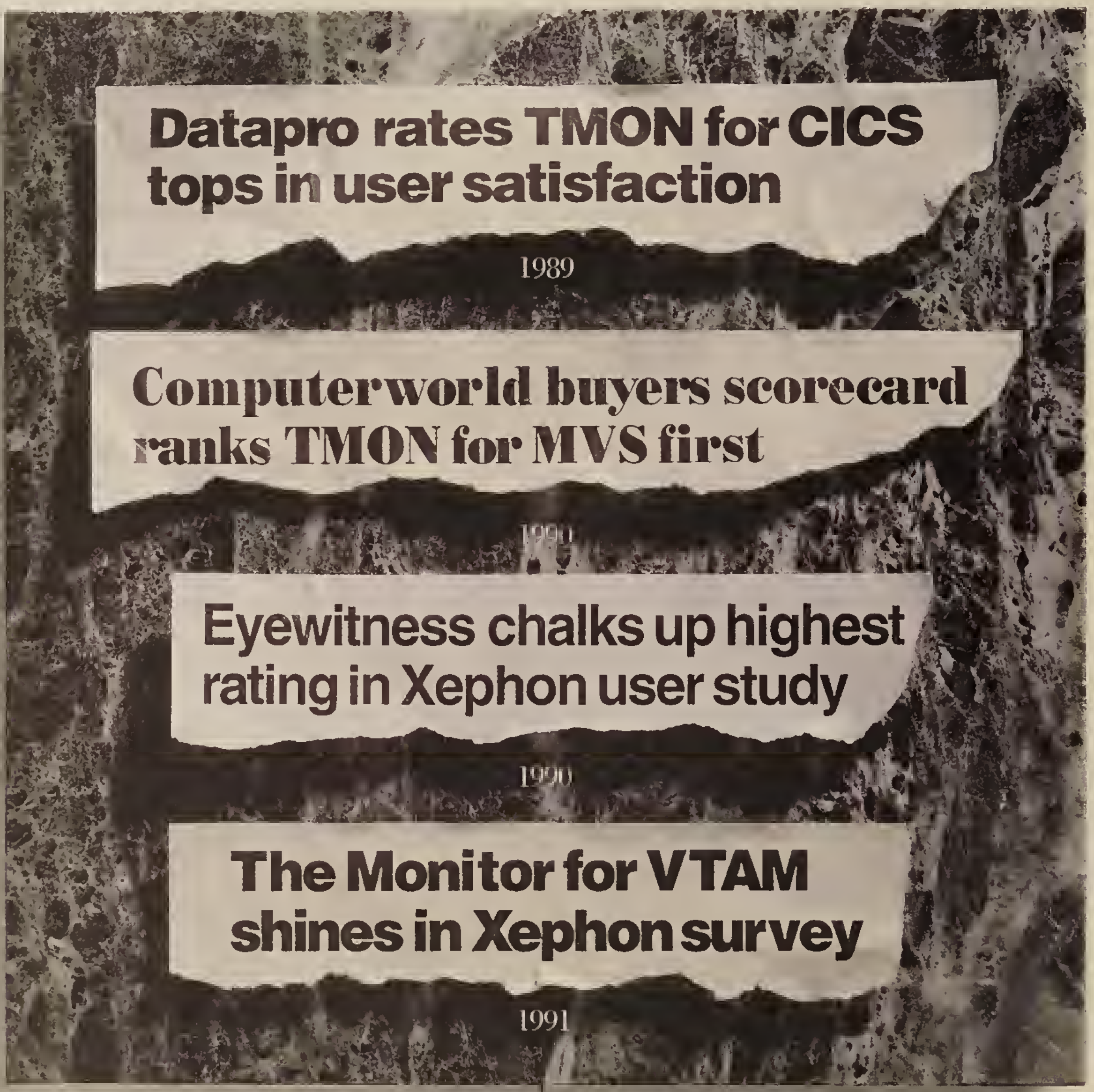
Under terms of the agreement, NCR's System 3000 — a scalable, microprocessor-based Unix line — and its check-sorting signature-recognition hardware systems will be coupled with image statement software from Document Solutions, Inc. in Birmingham, Ala.

Formed last year, Document Solutions specializes in imaging software for banks with assets of $50 million to $500 million.

The NCR/Document Solutions effort will involve approximately 200 NCR salesmen from more than 50 offices who will work with Document Solutions' sales and technical staff, according to the companies.

Last October, NCR and Wachovia Corp., a Winston-Salem, N.C.-based bank holding company, announced a strategic partnership to test NCR's Scalable Image Item Processing System (SIIPS). SIIPS, which also uses the NCR System 3000 hardware platform, is scheduled for release in 1993.

A scalable solution, SIIPS will initially be targeted at large financial customers with assets of more than $1 billion, NCR said.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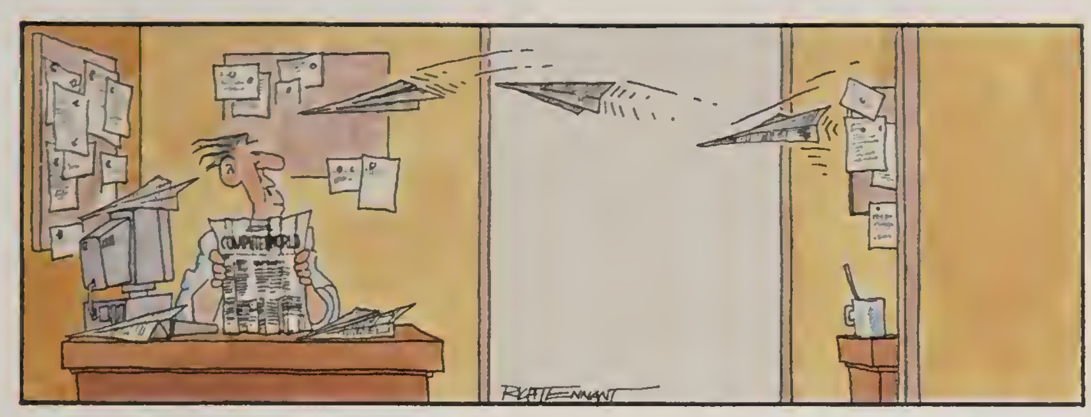

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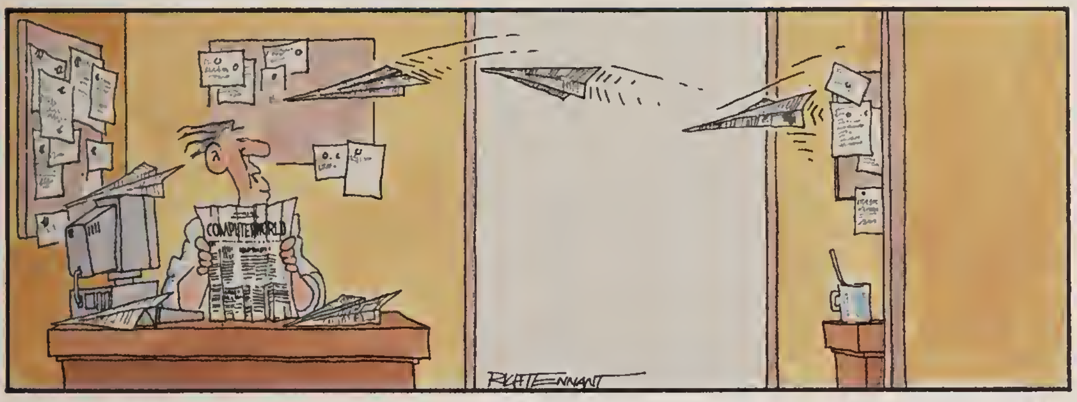

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# Pentagon opens software reuse center

*Reuse could help the federal government save $15 billion in annual software expenditures*

BY GARY H. ANTHES
CW STAFF

FALLS CHURCH, Va. — The U.S. Department of Defense (DOD) laid a cornerstone in its huge Corporate Information Management (CIM) program last week when it opened its Center for Software Reuse Operations.

The center provides access to the Pentagon's new Defense Software Repository, which contains 2.2 million lines of Cobol and Ada code in 1,531 reusable software modules.

The software, mostly for financial and logistics applications at present, is available to users throughout the department and to DOD contractors via an automated catalog and retrieval system. "We're open for business. The software is available," said William Galler, deputy program manager for software reuse at the Defense Information Systems Agency.

The repository was stocked initially with software taken from the U.S. Army's Reusable Ada Products for Information Systems Development system, which last week won a "golden nugget" award for excellence from CIM director Paul A. Strassmann.

"We'll get 50% of our needs from reusable components," said Strassmann, the Pentagon's director of defense information. "This will help get the bugs out and help with maintenance."

CIM is a set of initiatives that includes software reuse, computer-aided software engineering, elimination of redundant systems and a cut in the number of DOD data processing centers [CW, June 8].

Strassmann said he expects software reuse to bring about half of the $30 billion target reduction in annual software expenditures resulting from CIM.

Robert Neubecker

# Prime eliminates hardware group

BY KIM S. NASH
CW STAFF

NATICK, Mass. — Prime Computer, Inc. will shut down its entire hardware business immediately, halting previous plans to sell the division to a group of company managers led by Neil McMullen, the president of Prime's hardware group.

The company filed documents with the Securities and Exchange Commission (SEC) last week, stating that McMullen's group, ComputerVision — Prime's software unit — and unnamed third parties were "unable to reach final agreement."

As a result, all hardware manufacturing operations will be discontinued. Prime's proposal to take ComputerVision public remains in effect.

The move leaves Prime minicomputer customers at a crossroads. One path would let the approximately 9,700 Prime minicomputer sites press on, receiving support from the PrimeService group that was recently folded into ComputerVision [CW, June 8].

The other road leads Prime users away from the vendor. The SEC papers outline an undefined "short-term" plan to "aid existing customers for an orderly transition to alternate hardware."

**Where to now?**

Some users will forego that favor. For example, Stan Zelepsky, manager of information resources at the energy division of Zurn Industries, Inc. in Erie, Pa., said he has been preparing for the Prime shutdown for two years now.

"Even the staunchest Prime supporters have seen the writing on the wall," Zelepsky said. A faithful Prime customer for a dozen years, his division is midway through migrating engineering applications from a Prime 2950 minicomputer to a network of Sun Microsystems, Inc. workstations.

On the business side, the company plans to keep a Prime 9955 for another year and a half, "but now that we've been able to touch and feel Unix, it does seem to be the way to go," Zelepsky said.

Hamamatsu Corp. in Bridgewater, N.J., is in the uncomfortable position of having just spent $100,000 on a 5350 model. Eric Atanda, who is responsible for systems and telecommunications at the scientific tools maker, said Prime gave no indication that it was closing down.

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## ADVANCED TECHNOLOGY

# Fingerprinting a computer security code

*Biometric devices secure computers beyond a reasonable doubt using personal characteristics no one can steal*

BY JAMES DALY
CW STAFF

They can steal your access card, and computer passwords are easily cracked. But nobody can steal your retina. Or your fingerprint. Or your voice pattern.

After serving as high-security watchdogs at government installations for the past 20 years, biometric security devices — which identify people through unique body characteristics — are finally gaining supporters in many commercial installations. The reasons are many, including the fact that some individual biometric security devices now cost less than $2,000, down from almost $9,000 in 1985.

More importantly, however, is that many in the security field believe there is no more foolproof way to identify individuals than through biological characteristics — retinal blood vessel patterns, hand geometry and fingerprints — and their behavioral idiosyncrasies, such as signature, vocal intonation and keystroke dynamics. Biometric identifiers, unlike memory-based secrets, cannot be transferred by threat or gift.

"These things are hard to fool, no doubt about that," said Dale Bader, supervisor of operations support at Alascom, a long-distance telecom service in Anchorage, Alaska, that uses a retinal scanner from EyeDentify, Inc.

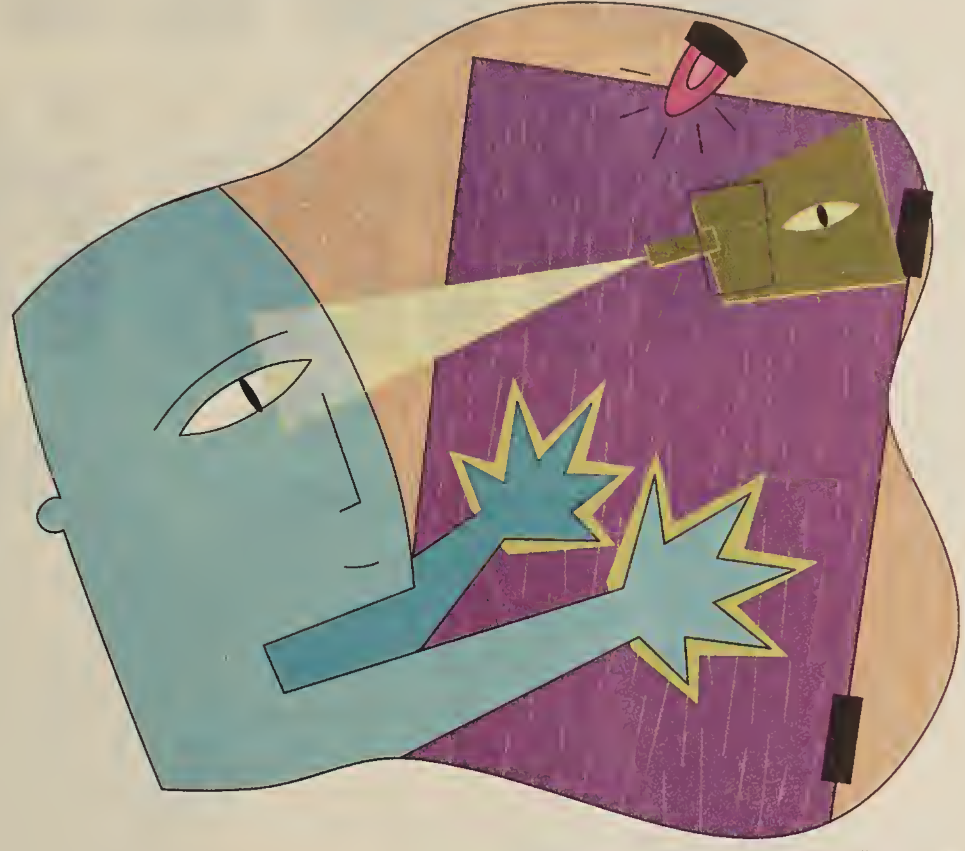
Security experts say the current method of accessing computers through a password is inadequate in terms of security and administrative costs. Computer crackers and dissatisfied employees breaking into computers pose a serious security threat, particularly as more computers are linked via file-sharing networks.

Meanwhile, biological characteristics such as retinal blood vessels are unique — not even identical twins have the same patterns. And James Bond movies notwithstanding, even a corneal transplant will not fool a retinal scanner.

### Gaining attention

Today's most popular biometric security devices include fingerprint readers, retinal scanners and devices that recognize handprints and signatures (see story below).

Using a biometric security device is a two-stage process: During enrollment, a computer-generated template is created that the machine will use to match the pattern of the person seeking access. During log-on, the user's pattern is scanned and compared with the template created during enrollment. In many cases, the user will also enter a personal identification code, and both need to match for access.



Janell Genovese

The systems are not without their glitches, however. Although the systems are much better than in their hit-and-miss early days, problems can still occur. Dolores Tilton, who manages the law offices at the Bank of Boston, uses a fingerprint scanning device that works "most of the time." She adds that when users' hands are cold, they sometimes get rejected. Other people's fingerprints will never get a correct reading, Tilton said.

Bader noted that Alascom's retinal scanning system occasionally will not recognize a pattern if the user is not situated correctly. "If a person is a little crooked, they'll be denied access," she said. But, she added, "that's the user being sloppy, not the machine."

### Accuracy is key

All of this points to the fact that biometric identifiers have to be practical. "A reject rate of even 1% is too high," said David Stang, chairman of the International Computer Security Association in Washington, D.C. "If you have five users a day out of 500 whining, it's going to get irritating fast."

Many biometric security devices can be intimidating to users the first few times. Fingerprint scanners, for instance, may be associated with criminal bookings. And some users fear retinal scanners because they do not like the idea of exposing their eyes to the infrared light these devices direct through the pupil to the back of the eye to read retinal patterns.

But people should get used to biometric devices because they are expected to become more pervasive in everyday life. New York's Kennedy Airport, for example, will soon begin testing a system developed by Recognition Systems that uses infrared hand scans to cut delays caused by passport checks. A traveler inserts his passport's computer-readable page into a machine while placing his other hand into a scanner that reads such characteristics as the distance between finger joints. The two-second process can tell whether the passport belongs to the person holding it.

While most biometric devices today secure physical access to computer areas, experts said that will change as users become accustomed to secure computers. Already, one contractor for the Department of Defense has a database that requires users to pass muster on an EyeDentify retinal scanner before they gain access. But high cost prohibits most such use at commercial establishments.

Security experts like Stang expect biometric devices to get even more sophisticated. Stang has envisioned what he calls a "biometric access control product" in which a user sits down at his terminal and the machine lets him in. His chair, coupled to his machine, weighs him and records the information. Today's weight is compared with the weight at his last session. The more sophisticated models would also measure the pressure of a user's back against its back to get a sense of the person's degree of slouch.

That is a prospect security personnel are anxious to embrace. Biometric security devices "are so wonderful because they are so easy," Bader said. "One day we'll wonder how we ever felt secure without them."

## Personal security

*The following is a list of some of the commercially available biometric security devices:*

- **Fingerprint readers.** These identify people by the shape and number of "minutia," points where fingerprint ridges fork or end. Leading manufacturers include Fingermatrix, Inc. in North White Plains, N.Y., Identix, Inc. in Sunnyvale, Calif., and Identity Systems International, Inc. in Edmonton, Alberta.

- **Retinal scanners.** A typical scanner sends a beam of low-intensity, near-infrared light through the pupil, illuminating the retina. Since blood vessels absorb more light than the surrounding tissue, the scanner can measure intensity variations at points on the retina. These values are digitized and matched against the "eyeprints" stored in the database. The leading vendor is EyeDentify in Portland, Ore.

- **Hand geometry.** A reader uses light to construct a three-dimensional image of a person's hand, examining such characteristics as finger length, width and hand thickness. Popular systems are made by San Jose, Calif.-based Recognition Systems and Palmetrics in Portland, Ore.

- **Voice verification.** A technology that constructs a mathematical model of a speaker's vocal tract, which is used to identify a voice pattern. Manufacturers include Alpha Microsystems in Santa Ana, Calif., and Voice Check, Inc. in Boulder, Colo.

- **Signature recognition.** A pattern recognition technology that learns both what a signature looks like and how it is executed. Signatures are also analyzed through pen pressure, character shape and pen acceleration. With each acceptable signature, the individual's file is updated to allow for natural drifting in the user's signature over time. Makers of such systems include Menlo Park, Calif.-based Communication Intelligence Corp. and Autosig Systems, Inc. in Irving, Texas.

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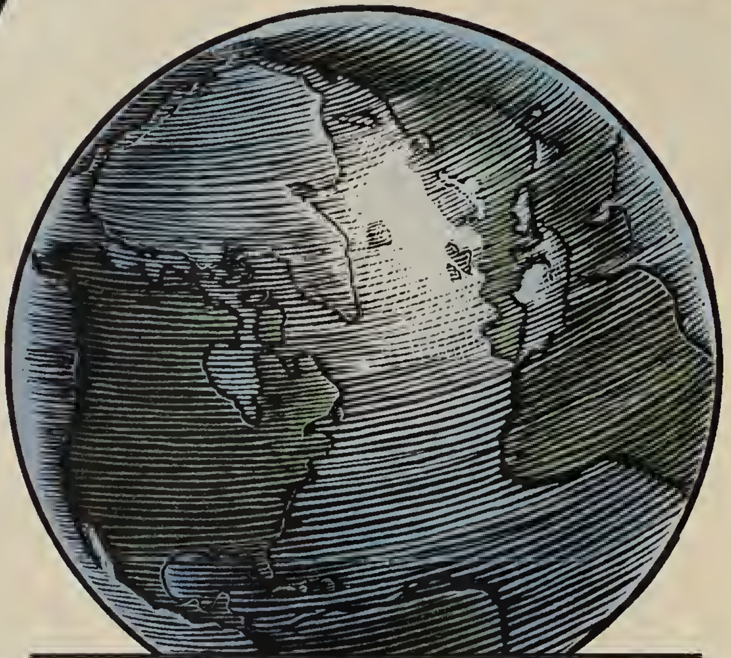

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**EDITORIAL**

# No time to lose

|  | Revenue | Employees | Revenue per employee |
|---|---|---|---|
| **DEC** |  |  |  |
| 1986 | $7.6B | 94,700 | $80,148 |
| 1991 | $13.9B | 121,000 | $114,967 |
| **Hewlett-Packard** |  |  |  |
| 1986 | $7.1B | 82,000 | $86,609 |
| 1991 | $14.5B | 89,700 | $161,572 |

Which of the above companies is in trouble?

By now, everybody knows the answer to that question, and the departure of Ken Olsen from DEC is only the first step in the long journey that company must make back to profitability.

I'll miss Olsen. He is part curmudgeon, part teddy bear, a brilliant engineer, a technical visionary and one of the few genuine characters in the industry. But I would have missed DEC a lot more if it had stayed on its current course.

Compare DEC to Hewlett-Packard, whose chairman, John Young, retired the same day as Olsen. Both companies cut their teeth selling computers to engineers. Both put down roots in proprietary systems and risked being swamped by the move to openness.

The difference is that HP saw it coming. In 1986 and 1987, it clamped down on hiring and put forth a radical strategy to convert its products to a RISC/Unix architecture. It committed to maintaining a competitive PC product line and began to build a desktop peripherals business that today is the envy of the industry. Above all, HP decentralized and pushed profit-and-loss responsibility down to the divisions.

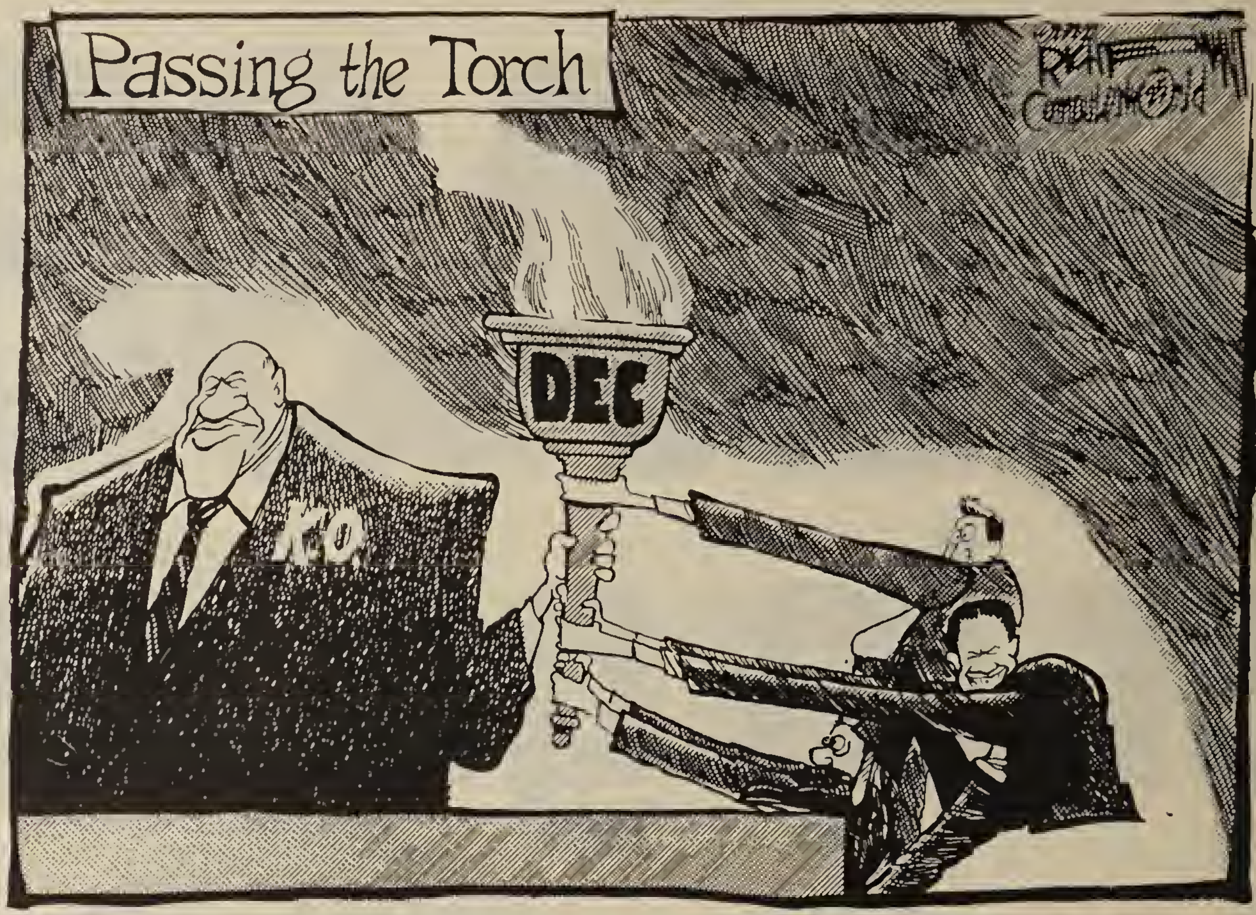
DEC has been late or unwilling to adopt any of those strategies and, as a result, finds itself in a terrible mess. The mandate for DEC's president-elect, Robert Palmer, is to make changes fast. Palmer also should adopt a 100-days strategy that by year's end makes a dramatic statement about where this company is going.

DEC needs to lose at least 20,000 employees to bring its cost structure back within striking distance of the rest of the industry. Palmer also should consider decentralizing the organization to a much greater degree.

DEC must commit every resource it has to moving its customers to the Alpha line with a minimum of cost and pain. Most importantly, DEC must ship Alpha on time — or early. And the product's gotta be good.

DEC's customers really want the company to succeed, and you can't buy loyalty like that. But dire problems call for drastic solutions. Now's the time for action.

Paul Gillin, *Executive editor*



**LETTERS TO THE EDITOR**

## Hot tub photo in poor taste

I see your publication treats women in computing flippantly. No wonder there are so few in this field.

In the June 29 issue's pictures of men, men work. In the pictures of women, they are pretty but obviously not good for working. Women work, too.

I would have hoped your publication would indicate that through its choice of images. I hope you use better images in the future.

*Gerald W. Edgar*
*Renton, Wash.*

..........

Regarding "L.A. support system up in smoke" [CW, Executive Report, June 29]: Every photograph of an IS professional in this issue either depicts that person in a business setting or is a formal head shot — except for one: Peggy Stoker, IS chief and head of the trauma and EMS system for Los Angeles County. She is shown in her hot tub.

I was very surprised and discouraged that *Computerworld*, a publication reporting on an industry that generally treats women with respect, should be so insensitive as to the message they were sending.

*Dorothy Klauber*
*Oradell, N.J.*

## Software development in the Stone Age

To accept Francis Walnut's notion ["Lofty ideas don't build systems," CW, June 15] that software development can be more efficiently addressed by someone who works with a computer in his basement reflects the antiquated practices that have put the state of software development where it is today: in the Technology Stone Age.

Most of the software development done by organizations today requires many participants from the end-user community, management and IS groups.

Second, Walnut's contention that software engineering implies that once the specifications are complete, the creative process is finished is not grounded in reality. Engineering techniques provide a desperately needed dose of discipline to the area of "requirement specification." Historically, this has been ignored by the systems development community. What have resulted are systems that require a great deal of creativity by implementation staffs to make them functional for the end user.

Third, while there is little to argue with about the importance of software systems implementation, far more errors occur because of incorrect software specifications.

The techniques and tools being put into use today, most notably Information Engineering and I-CASE tools, are squarely focused on providing real solutions to real business problems. Better system implementation will not occur until we understand all aspects of software development and adopt the tools and techniques that enable efficient software implementations.

*Raymond M. Thompson*
*Livonia, Mich.*

## Intellectual property proposal ridiculous

Regarding "The dangers of selective information sharing" [CW, Viewpoint, July 13]: A free market economy is not predatory; it is consensual. You may choose to compete, or you may choose not to.

For Randall Kennedy to say that Microsoft must share its hard-won code with any and all comers that simply appear at its doorstep whining about "need" is not only preposterous but also disgusting.

Nondisclosure agreements allow Microsoft to protect its intellectual property with the force of law. Intellectual property, whether it belongs to a corporation or to an individual, deserves — and demands — the same amount of protection as any other property — perhaps more so than other forms of property.

Intellectual property rights promote the greater good. Knowing that the product of your mind will be protected from sponges and moochers will free you to continue to develop newer and better applications, rather than staying with what has already been done.

*Kevin Slattery*
*Mariposa, Calif.*

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Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

IDC
INTERNATIONAL DATA CORPORATION

# White Paper

## NETWORK PRINTERS

# Until now, network printers have had the same fifteen-foot restriction.

## With HP network-ready LaserJets, you can put your printers where your users are.

Now you can forget about tethering your printers to some faraway server. Because network-ready LaserJet printers can be placed anywhere along your network. Just plug them in as you would PCs and you're ready to roll.

Since you're putting printers by your users, it's as if you're giving them their very own personal printer. Which means they won't have to travel as far for output. Because they're closer to the printer, they can handle some of the routine maintenance tasks, such as paper loading, themselves. Best of all, you won't have to contend with extra boxes, wires or power cables.

*HP LaserJet III* *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

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## Introduction

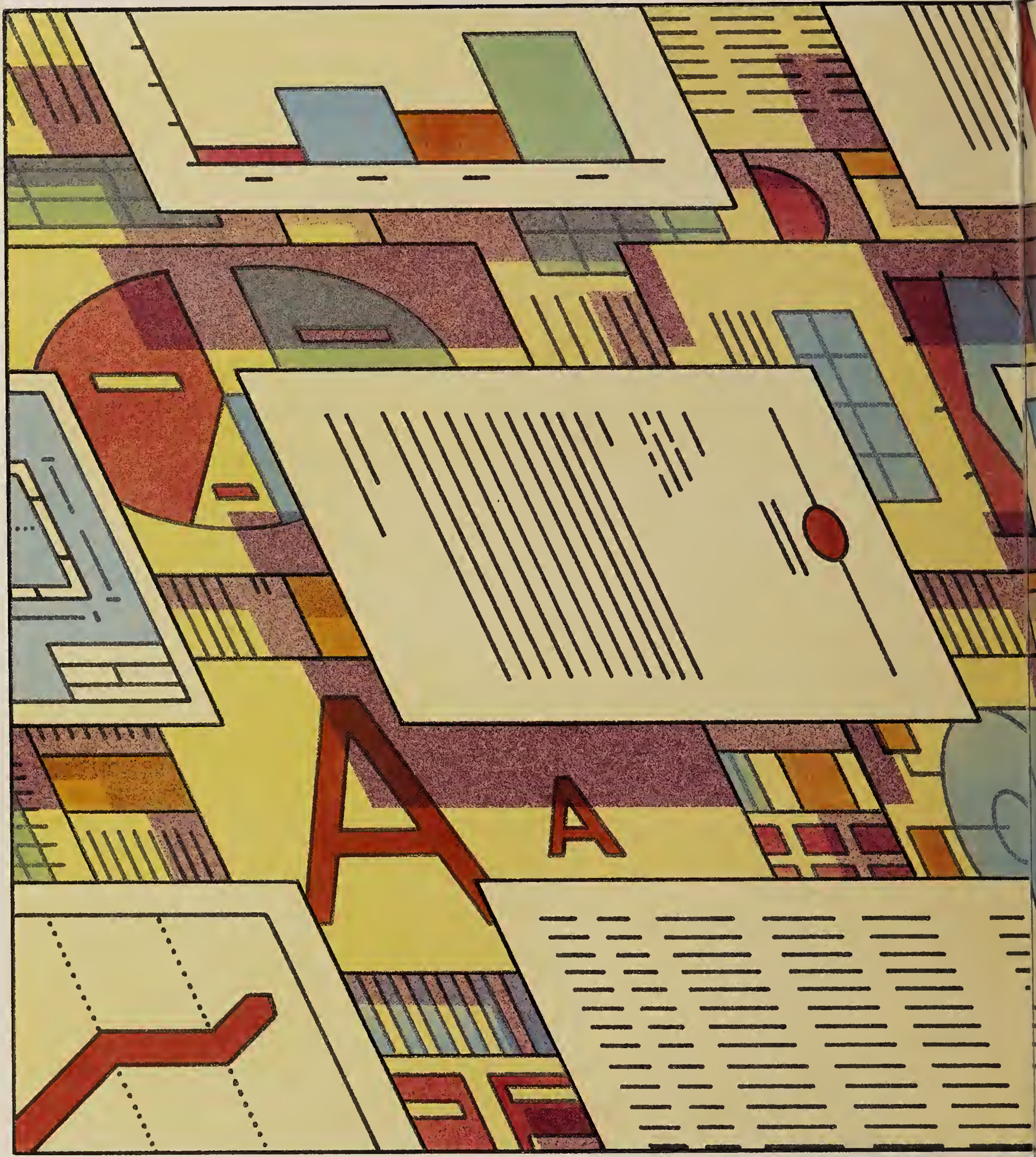
Local area networks have certainly made their impact felt in the computer world. Although some criticize them for their utilitarian applications — they are largely used to link PCs with local printers and storage devices — the fact remains that localizing printer and memory capabilities has vastly changed the nature of computing.

Liberated from the tyranny of centralized, mainframe environments, users have become more productive within departmental workgroups. This local processing trend is strong and growing; IDC research indicates that, by 1996, users believe that 69% of PCs will be attached to LANs. As is frequently the case with technology trends, there is a downside to the great LAN proliferation: integrating printers is a complex challenge for LAN administrators. Despite the printer's importance to users, they are not a top priority for network operating system suppliers. As a result, printer and third-party vendors who make accessories or enhancement products have inherited the challenge of network administration.

Currently, printer interface and software technologies are years away from offering the ability to transmit any print job and have the system intelligently and transparently print it at the closest available printer. Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will continue for the next three to five years. Until it is resolved, network configurations will fail to maximize printer capabilities.

There are, however, interim solutions that ease the burden of printer administration. Although these fixes will not do the job over long periods of time, the day will come when print management software, which is currently in its nascent stages, will seamlessly accommodate different data streams on LANs.

This White Paper was written independently of the *Computerworld* editorial department
by Angele Boyd, Director of Printer Research,
at International Data Corporation.
For more information on the content of this White Paper, or for information on
International Data Corporation, please call 508-872-8200.
For more information on the White Paper Program, please call 508-879-0700.



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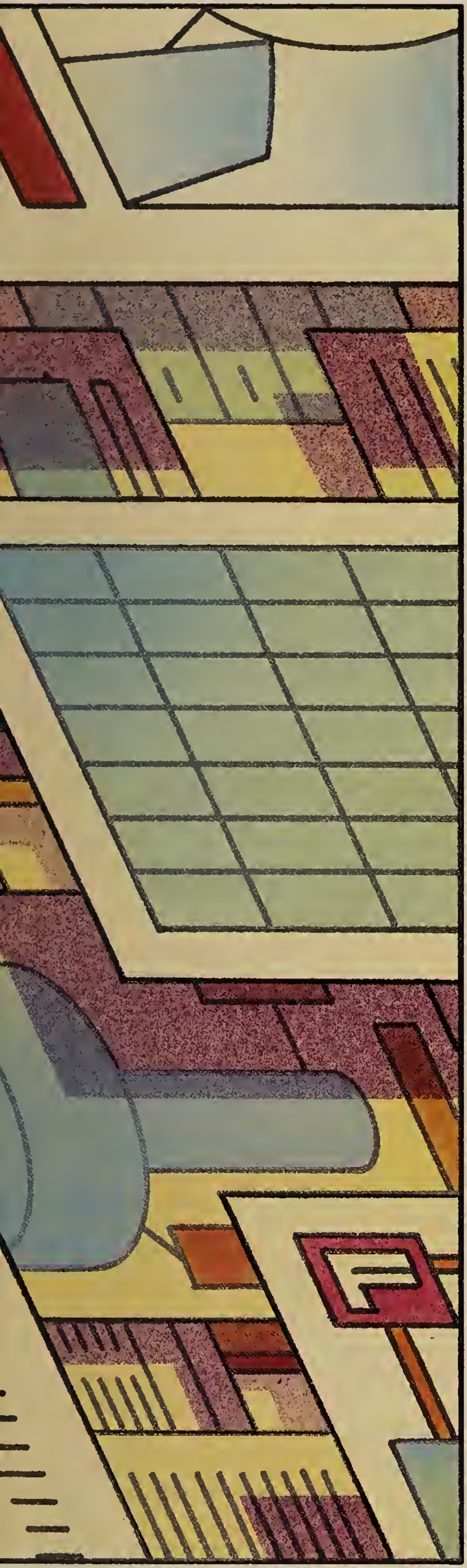
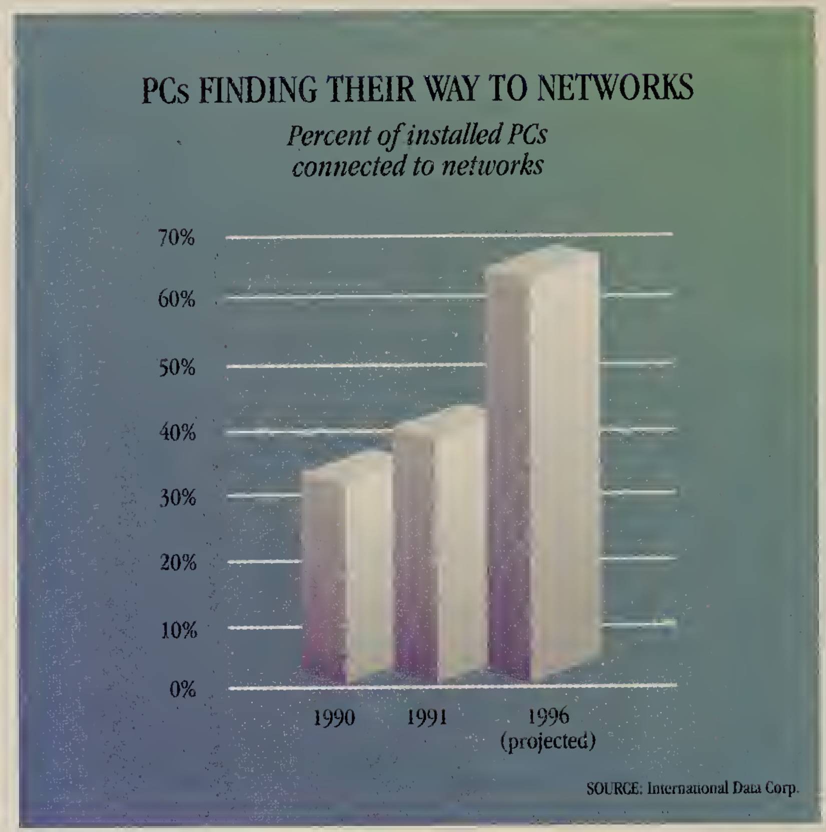


# NETWORK PRINTERS

THE RAPID PROLIFERATION OF LOCAL AREA NETWORKS (LANs) AND PRINTERS IS BRINGING THESE TWO PROMINENT TECHNOLOGIES TO A CONFLUENCE THAT WILL INCREASE THEIR UTILITY AND PROVIDE THE COST-EFFECTIVENESS REQUIRED TO JUSTIFY THE GROWING LEGIONS OF DESKTOP COMPUTERS. ■ ALTHOUGH PRINTERS OBVIOUSLY REPRESENT A FAR MORE MATURE TECHNOLOGY THAN DO LANs, LASER PRINTERS ARE EXPERIENCING SIGNIFICANT GROWTH, IN PART BECAUSE THESE PRINTERS ARE FINDING THEIR WAY INTO MORE AND MORE CORPORATE NETWORKS. THIS CONTRIBUTES TO LAN GROWTH, WHICH IS STIMULATED BY THE ABSORPTION AND PURCHASE OF NEW AND MIXED-PLATFORM NODES, SERVERS AND PERIPHERALS SUCH AS PRINTERS. ■ DESKTOP COMPUTERS ARE BEING CONNECTED AT A HIGH RATE AS CORPORATIONS STRIVE TO LEVERAGE THE HUGE CAPITAL INVESTMENTS THEY MADE IN THESE SYSTEMS DURING THE PAST DECADE. ■ IN A FOURTH-QUARTER 1991 IDC SURVEY, of 1,600 U.S. users across vertical markets (excluding government and education), respondents report 44% of their PCs are connected to LANs. Respondents expect this LAN penetration rate to accelerate, predicting 60% of their PCs will be attached to LANs by year-end 1992. IDC's total market data indicates a similar but slightly tempered trend when portable PCs are included. During 1989, 26% of installed PCs were linked to LANs. That number escalated to 34% in 1990 and 42% in 1991. By 1996, IDC predicts that 69% of PCs will be on LANs.



SOURCE: International Data Corp.

Additional IDC research indicates that, on the printer side, 30% to 40% of laser printers outputting 11 pages per minute (ppm) or fewer sold to business users are linked to LANs compared with 65% to 70% of 12-19 ppm models. Twenty-five to 35% of line printers and 30% to 35% of high-speed serial dot matrix printers are destined for LANs.

Intuitively, it seems LAN installations will be motivated by the need to share applications. And in fact, sharing peripherals such as printers is a leading reason for installing networks. A December 1991 *Infoworld* subscriber study finds that printer sharing and storage device sharing are the most cited reasons for installing LANs. These two reasons are cited by 84% and 74% of respondents, respectively.

The nature of the LAN hierarchy is changing. Increasingly, LANs are comprised of different platforms such as workstations, PCs, Macs, minis and mainframes. And a large percentage of LANs are bridged to another LAN, wide area network (WAN), minicomputer or mainframe. In such cases, printers are accessed across the platform.

## PRINTING PROBLEMS PLAGUE LAN ADMINISTRATORS

Integrating printers is a complex problem for LAN administrators. Although printers are important to users, they remain a lower priority for Network Operating System (NOS) suppliers, who continue to focus on data access, communication and security. As a result, printer and third-party vendors who make accessories or enhancement products are left to solve the network administrators' problems.

> *"Common problems experienced by end users include excessive waiting times, inaccessible or inconvieniently located printers, and problematic network print management features."*

Once a printer is shared by at least two users, every printer feature should be remotely and dynamically accessible by each user. In an ideal world, the printer/NOS should be able to transmit any print job, regardless of font, data stream or required forms, and have the system intelligently and transparently print it at the closest available, appropriate printer. Notification of job status would then be communicated back to the user.

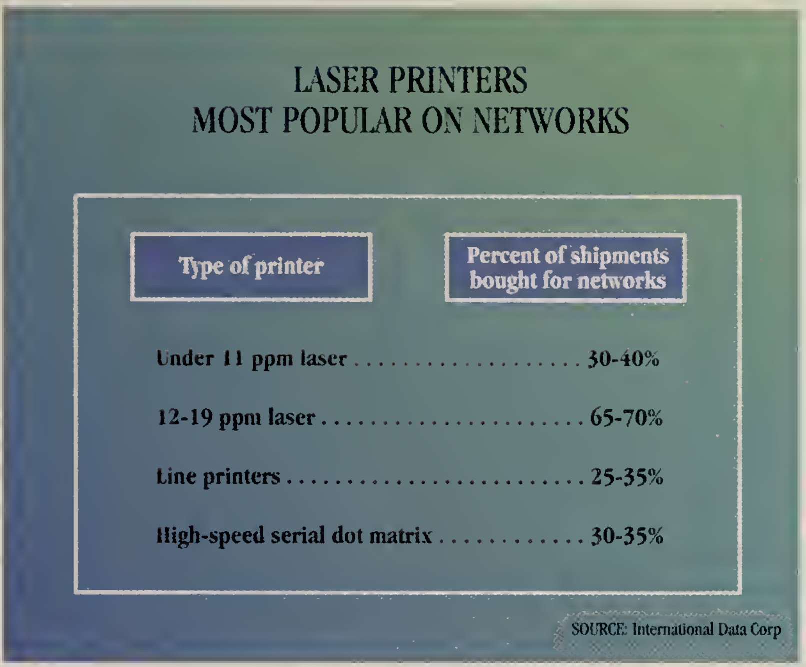
At this point, printer, interface and software technologies are years away from this ideal. This is less attributable to technical limitations than it is to the lack of cooperative development between printer and software suppliers. There are, however, solutions available today that will make printing and print administration more user-friendly to users and network administrators alike.

Currently, the NOS limits user knowledge and control of the print function except in rare instances where there is some degree of two-way communication between printer and network users. More typically, when a print job is transmitted across a network, there is limited control over which printer will be utilized, and no guarantee that the job will be printed in the form requested. At best, the typical NOS notification regarding a specific job informs the user if the printer is busy, shut off or out of paper. "Busy" can mean anything from being truly occupied to some type of printer malfunction.

The NOS may also permit the user to determine and change the job's print queue status within the constraints determined by the LAN administrator. However, the user is usually limited in printer choice, since the LAN administrator has generally predefined print queues for specific applications, print format parameters and particular individuals' access.

Further, the user's ability to determine font type, page orientation (portrait or landscape), or graphics content may not be respected for a number of reasons. For instance, the printer's random access memory may be inadequate to accommodate the requested fonts and graphics. Or, the desired fonts may be unavailable at the printer. In these instances, at a minimum, the user should be informed that there is a problem, and be given options for dealing with it.

Where possible, the problem should be solved transparently for the user. This could happen in the case of best-fit font substitution. However, due to the wide variety of printers and network environments, the kinds of solutions mentioned here may not be available.



LASER PRINTERS
MOST POPULAR ON NETWORKS

| Type of printer | Percent of shipments bought for networks |
|---|---|
| Under 11 ppm laser | 30-40% |
| 12-19 ppm laser | 65-70% |
| Line printers | 25-35% |
| High-speed serial dot matrix | 30-35% |

SOURCE: International Data Corp

Common problems experienced by end users include excessive waiting times, inaccessible or inconveniently located printers, and problematic network print management features. Most important network print management features involve communication to users concerning breakdowns, job completion, low consumables and intelligent routing and font downloading.

Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will persist for the next three to five years. Limitations in printer designs, along with those in application and NOS software printer support, have resulted in network configurations that fail to maximize printer capabilities.

## PLANNING TO MEET THE CHALLENGES

With careful planning, network printing problems can be avoided by addressing five areas. They are: capacity, homogeneity versus heterogeneity, printer location needs, software applications, and graphics/images and font usage.

### Capacity

Capacity refers to the number of users, the number and size of jobs, and the type and size of media users require. It is important to consider current and future capacity needs.

In assessing capacity the goal is to be able to select the right number of printers, as well as the correct printing speeds and features. It is important to know whether users tend to print many short (up to 10 pages-per-document) jobs, a few long jobs, a mix of short and long jobs, or small jobs with high-volume bursts at the end of transaction periods.

IDC studies show that the most common speed of network-based printers regardless of network capacity is 8 ppm. This is true despite the fact that such speed is only appropriate for small workgroups of three-to-four users. Although there is an increasing availability of low-cost sub-8 ppm personal, single-user printers, the trend for the LAN printer market is away from such devices.

Largely as a result of cost-conscious management, standalone desktop computers are being networked, and the hidden costs of ownership (consumables, maintenance) of personal page printers are viewed skeptically. The clear trend is toward higher performance page printers that are suitable for sharing by five-to-twenty users.

> *"It is wise to examine printer use patterns. Sometimes, printers are used as convenience copiers."*

Fortunately, a new class of laser printers, the most common printing technology shared on networks, is available. At 15-20 ppm, these printers run at twice the rated speed of earlier 8-11 ppm models, and are designed to be shared by five-to-ten users, but may accommodate up to twenty.

These printers often list for under $5,000, and typically range from $2,400 to $16,000. Their monthly duty cycles — the maximum pages per month recommended by the manufacturer — range from 25,000 to about 50,000, which makes them appropriate for small to midsize workgroups. They are available from a number of vendors including Data-products, DEC, Fujitsu, Genicom, Hewlett Packard, Image Systems, QMS, Texas Instruments and Toshiba.

When choosing printers, paper handling is important to consider. The larger the number of users sharing the printer, or the longer the print jobs, the greater the need for a printer with large capacity input and output. This situation also calls for output handlers with a job offset capability and/or mailboxes/sorters.

Low-to-mid volume output is considered to be 300-600 pages per person per month, while high volume is 1,000-1,500 pages per person per month. Eight ppm printers often only have one 200-250 sheet input bin, a slightly smaller output bin and no job offset capability. In contrast, the new breed of workgroup printers often has two 500-sheet input bins, job offset and/or optional (additional cost) mailbox/sorters.

It is also wise to examine printer use patterns. Sometimes printers are used as convenience copiers. This practice increases print capacity needs, although it may be appropriate under some conditions. A cost-benefit analysis can determine when such conditions exist and whether it makes sense to select personal, rather than shared, printers for networked users. Generally speaking, the lower the laser printer speed, the greater the cost to produce a page. More on this can be found in the article appearing in the April 20, 1992 issue of *Computerworld* entitled "Six Steps to Calculate Cost of Ownership."

Thus, giving everyone on the network his own four-to-six ppm personal laser printer is less cost-effective than sharing workgroup printers on the network. There are times when personal printers are appropriate, i.e., when the user is high-ranking, someone who requires stringent security or someone whose job requirements warrant a dedicated printer.

Consideration should also be given to network users who need to print on 11x17 inch (ledger) paper, on two sides of a page (duplexing), and envelopes. Ledger paper is sometimes used for large spreadsheets, or for printing pamphlets and newsletters. Not all workgroup printers support 11x17 inch paper. It tends to be either a standard feature or not available at all.

Duplexing is popular in paper-intensive industries. Duplexed output costs less to mail, file, archive and otherwise store. When available, it is usually an option on low-to-mid speed (20 ppm and less) printers. It is usually either standard or not available at all on higher speed printers.

Envelope printing is generally available on personal and workgroup printers. Capacity varies, running up to 75 envelopes, and should be evaluated before before making a commitment.

### Homogeneity Versus Heterogeneity

Planning for a heterogeneous network with PCs, workstations and minicomputers that have shared printer capabilities requires understanding the physical interface, protocol, and page description language (PDL) requirements for the mixed platforms.

The NOS is simply a conduit for the mixed formats and does nothing to translate them into a specific printer standard. Even when the NOS provides print services to support mixed platforms, the user must still find a printer that can handle them and their PDLs.

It is still common to use a parallel interface to attach a laser printer to a PC server. However, this is changing in favor of direct network interfaces to LANs such as Ethernet and Token Ring. The Macintosh uses either its own version of a serial interface or a Localtalk interface.

Direct connection to the network is preferable, so take note of what topology (Ethernet or Token Ring) the network employs. When choosing a network printer, be sure the printer's physical interface matches network requirements.

**MOST IMPORTANT NETWORK PRINT MANAGEMENT FEATURES**

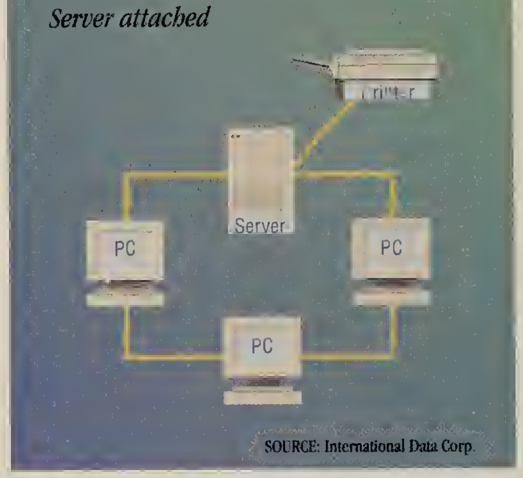
- **Remote sensing of printer breakdowns**
- **Automatic downloading of fonts as needed**
- **Job completion notice to users**
- **Remote sensing of low consumables**
- **More intelligent print job routing**

SOURCE: International Data Corp.

> *"...much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on network operating system software."*

NETWORK PRINTER CONNECTIVITY OPTION 1

*Server attached*



SOURCE: International Data Corp.

In some instances, simultaneous operation of more than one printer port is desirable, and some printers support this. For example, the parallel and Ethernet ports can be operated together. However, it is important to determine if both ports can switch between PDLs, or whether they are fixed to support the same PDL. HP's PCL and PostScript are the two most common PDLs. In addition, TCP/IP and Appletalk are two protocols that may also require support.

Novell's Netware 3.11 (the 386 extension to the Netware name has been dropped), which was announced at Networld in February 1991, is an example of vendor support for mixed LANs. Netware 3.11 enables client devices based on DOS, Windows, Macs, OS/2 or Unix to share file and print services on a Netware LAN. Mac support was available on Netware 286 but not the 386 version, and Unix support was not provided at all. TCP/IP support is also integrated in 3.11.

Digital Equipment Corp.'s support for Unix, Ultrix and VMS in DECnet and TCP/IP environments, in addition to its support for PCs and Macs through Pathworks, are other examples of vendor support for complex LANs. Sitka's TOPS software offers more than just PostScript printer sharing across Sun workstations, PCs and Macs; it is a complete network operating system that lets each of the three platforms share files in their native mode.

### Printer Location Constraints and Network Connectivity Options

A key issue in planning for network printing is deciding where the printers should be located. In the past, technological limitations required that printers be attached to servers. This still presents logistical problems. For example, if the server must be secured after normal working hours, user access is constrained. If a user's system is concurrently acting as both a server and user node, that user will be inconvenienced every time someone comes into his office to print a job.

# Until now, waiting for network printing has required the same amount of patience.

**HP network-ready LaserJet printers help your users get their output faster.**

With an HP network-ready LaserJet printer, your users won't go begging for fast output. Network-ready LaserJets avoid parallel bottlenecks and print up to fifteen times faster than ordinary machines. Since your file server is relieved of some print-server functions, your printing network flexibility increases almost immediately. You'll enjoy faster transaction times. Greater security. And increased speed across your entire system.

*HP LaserJet III* *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX®, Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3074 for the HP Connectivity Solutions Guide.

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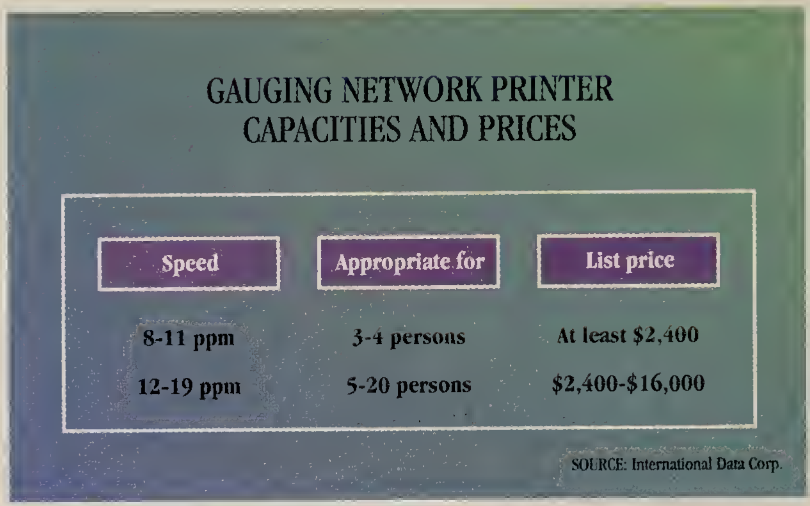


GAUGING NETWORK PRINTER CAPACITIES AND PRICES

| Speed | Appropriate for | List price |
|---|---|---|
| 8-11 ppm | 3-4 persons | At least $2,400 |
| 12-19 ppm | 5-20 persons | $2,400-$16,000 |

SOURCE: International Data Corp.

There are four major network printer connectivity options to consider:

- server-attached
- shared via user node with spooling done remotely
- shared via user node with spooling done at user node
- direct to network with network adapter.

### Server-attached

Presently, the most common attachment for LAN printers involves having one or more printers attached to a server responsible for file management, printer support and other services. The server may be a computer or a dedicated hardware box. At present, the principle NOS vendors can support a range of server/printer ratios from five-to-eight or five-to-sixteen through either serial, parallel or remote attachments.

This configuration is a legacy of the earlier days of NOS, when server connections were the only type of printer support that network operating system software provided. The NOS vendors, at that time, were much smaller companies, unable to fund a wide variety of system options. They also realized that offering other attachment options would only have stimulated third-party vendor competition.

Over the past three years, much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on NOS software. As an example of this phenomenon, consider Novell's withdrawal from the server market and DEC's Source Kits, which provide the necessary host software to drive DEC's Printserver printers from non-DEC Unix servers. With this new emphasis, the capability to support alternative printer attachments not tied to specific server hardware offers a competitive advantage for NOS vendors.

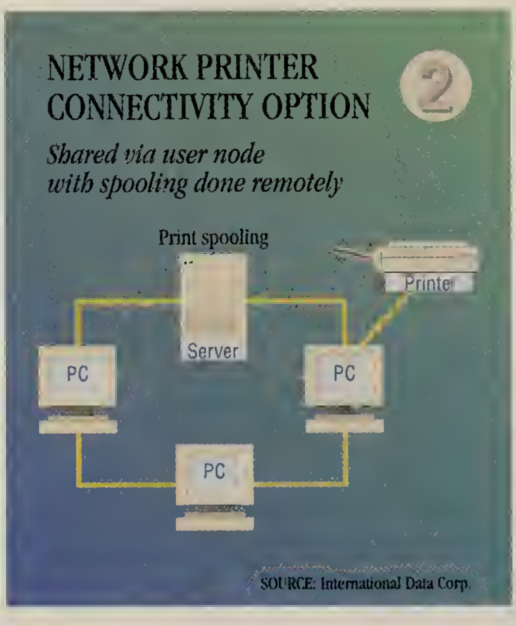
Tied to this has been the printer and printer accessory vendors' desire to make sure printers can be attached anywhere on networks. This has been such a major issue that several vendors, including Intel, Lexmark and Castelle, have developed very small network adapters that are transparent to the NOS and allow the printer to be physically attached anywhere on LAN cabling. The printer's serial or parallel interface is plugged into the network adapter, which, in turn, attaches to Ethernet or Token Ring network cabling.

### Shared via User Node with Spooling Done Remotely

The second most common LAN printer configuration is comprised of a workstation, usually a user's node, whose printer can be accessed by several other users on the network. The workstation does no spooling, and as a result, only one person can print at a time. Multitasking environments such as Unix and Windows prevent user interruption during print jobs.

However, in other environments, when a printing job is being processed, the node's ability to concurrently process other software is appreciably slowed. For this reason, the number of users with access to this printer is limited, usually to no more than three to five people.

A variation of this set-up is to have spooling done on a remote server. This allows print jobs to be simultaneously sent to the printer. In this variation, one or two printers are attached to the workstation. Novell, the most popular NOS supplier, now provides support for remote printing from the server, except under Entry Level Netware (ELS). ELS does not support remote printing because it supports only four to eight users.



NETWORK PRINTER CONNECTIVITY OPTION 2

*Shared via user node with spooling done remotely*

SOURCE: International Data Corp.

### Shared via User Node with Spooling Done at User Node (Concurrent Server)

This third LAN printer setup employs a concurrent server — a workstation used as a server providing print spooling and file service as well as end-user capacity. This configuration is not common because it suffers from the same problem as the shared node's printer mentioned above: the node's ability to concurrently process other software needs is appreciably slowed. This configuration can also present a data security risk. If an application crashes, the server function of the workstation is similarly affected.

### Direct to Network with Network Adapter

This is the least common configuration, but one that is increasingly being used because of its advantages. It consists of a printer with a built-in Ethernet or Token Ring interface connected directly to the LAN. By separating the file server function from the printing (spooling) function, data security is better addressed. Also, direct-connect printers benefit from enhanced transmission speeds on Ethernet and/or Token Ring. This provides a significant benefit for large Postscript, high-resolution, color- and graphics/image-intensive files being sent to a printer or a typesetter/imagesetter.

Traffic on the network and the interface to the printer are bottlenecks when it comes to speed of printing. When multiple print jobs are sent simultaneously across the network to the server, there is a delay while each job gets into and out of the server's print queue. More time is lost if the printer is attached to the server via a parallel interface instead of Ethernet or Token Ring. The contrast in communication speed is vast — Ethernet's maximum speed is 10M bit/sec and Token Ring's is four or 16M bit/sec while a parallel interface allows only 10K bytes/sec.

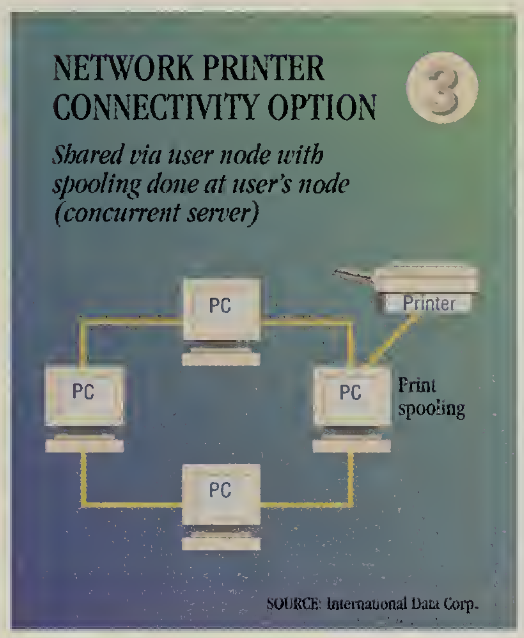
Since there is a direct relationship between an interface's performance and its price, high-speed Ethernet and Token Ring interfaces which list between $700-$900 are commonly used for higher cost printers. Accordingly, higher speed printers (15 ppm+), color devices, and high-resolution devices (600 dpi+) are appropriate candidates for those two cabling schemes.

A number of printer vendors have begun to offer Ethernet and Token Ring interfaces as options on their workgroup printers. These include HP, Toshiba, QMS, Apple and DEC. In addition, third-party vendors such as Intel and Castelle offer external network adapter cards for printers. These allow the connection of two-to-four printers per card.

### Software Applications

Knowing the applications and their versions is critically important. One of the most frequent problems encountered by users is their job not printing at all, or printing incorrectly. This frequently happens because the user unknowingly sends the job from an application configured to move output in a specific printer emulation format, to a printer whose current set-up does not match the incoming format. Network printers must be able to print and switch between the emulations supported by applications.

The ability of a printer on a network to seamlessly handle multiple data streams has high utility to both users and network administrators. This is particularly valuable in mixed networks where there is a need to support multiple data streams. Postscript, PCL, DEC ANSI, IPDS, Epson, and line printer have the leading page description language/ emulation market shares. Currently, because of the inability of most laser printers to automatically switch emulations, a PostScript printer is often set up to accept only PostScript while a separate printer may be designated for PCL output.


NETWORK PRINTER
CONNECTIVITY OPTION
3
*Shared via user node with spooling done at user's node (concurrent server)*
PC
PC
PC
PC
Printer
Print spooling

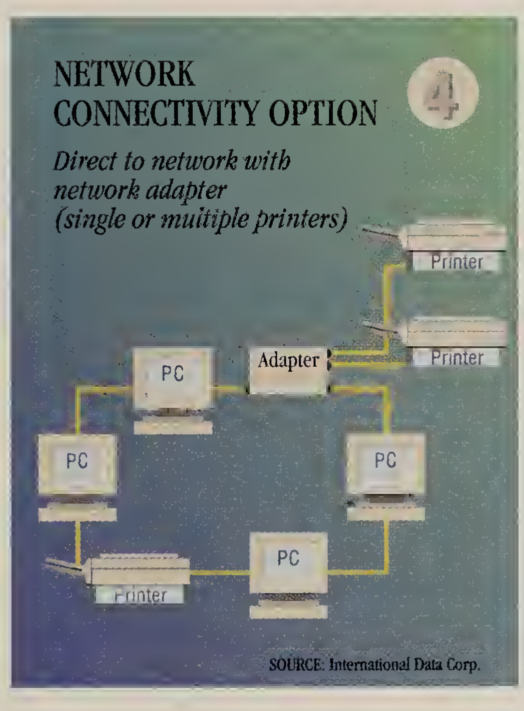
SOURCE: International Data Corp.

This limitation is changing as several non-impact printer suppliers including HP, QMS, DEC, Tektronix and Talaris offer printers that sense the incoming data stream and print them accordingly. Adobe, which developed Postscript, has just announced support for emulation switching.

### Graphics/Images and Fonts

As graphics make output more sophisticated in terms of images and fonts, the amount of data being transferred across the network increases. This has implications for the amount of required printer memory and network bandwidth required to transfer the job to the printer.

With fonts there is also the issue of WYSIWYG, the ability to see on the screen exactly what will be printed. To support the growing sophistication of user output, it is important to choose network printers that have memory expansion capabilities, WYSIWYG fonts, support for high bandwidth interfaces, and CCITT-based image compression capabilities.


NETWORK
CONNECTIVITY OPTION
4
*Direct to network with network adapter (single or multiple printers)*
Printer
Printer
Adapter
PC
PC
PC
PC
Printer

SOURCE: International Data Corp.

Most workgroup/network printers have generous memory expansion capabilities. While many offer a number of fonts on the printer, not all are WYSIWYG fonts. PostScript and PCL support image compression, the ability for a printer to decompress data is also expected to become important.

### NEXT GENERATION NETWORK PRINTING

Several printer and NOS characteristics build a case for print management software on the network. There is a need to transparently manage and distribute printing resources such as fonts, printer data streams and paper handling capabilities to users across the network. Print management software, currently in its nascent stages, will seamlessly handle different data streams by either locating an appropriate network printer that can handle the necessary data stream or translating it into a bitmapped code that is sent to a printer conveniently located near the requesting end user. Print server software from Insight Development Corporation offers a number of these capabilities.

It makes sense for print management software to assume much of this responsibility for groups of lower cost, lower performance printers. This way, it is not necessary to justify the incremental cost of the added intelligence and two-way communication interfaces needed to allow remote and transparent user access. Given that many LANs today are still relatively small — averaging twelve nodes — less expensive printers will continue to proliferate, making a compelling case for intelligent print management software.

In addition to reducing costs, printers running intelligent print management software can charge back to departments based on individual departmental usage.

# It's never been easier to manage your entire printing network.

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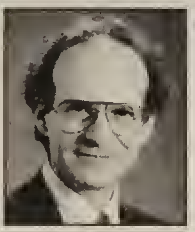
# Programming no longer enough

BOB FRANKSTON



There are too many programmers, just as there are too many lawyers. Both professions feel they are major contributors to productivity and the economy. Clients and users accept both of them because they do jobs that they don't know how to do or don't want to do themselves.

I'm not a lawyer, so I can't speak for lawyers. But I am a programmer. The term "programming" is pretty broad, even within the domain of computer software.

I'm using the term for the act of laying out the hoops that the computer must jump through and working at it until it executes the jumps perfectly, or at least frequently.

Ultimately, however, the point is not the fancy hoops but the task that the end user (who's that?) is trying to accomplish. The goal is to go from the user's specification to a program. In fact, what is the difference between the spec and the program? Why shouldn't the process be automatic?

If the process were automatic, the user would write a specification and the computer would execute it: no programmers to argue with. This would avoid the frustration of the user who understands the task but must deal with a programmer who insists that the part number must also double as a sector number (in octal) on disk.

It hobbles the user to have to rely on this other person to accomplish every mundane task. Having to call a programmer in to get any work done is just as bad as having to call a lawyer for every business detail. It is a symptom of something gone awry, rather than a solution.

John Nelson

There's a good parallel for what I'm suggesting in the evolution of telephone service. At one point, professional operators always handled the complete process of placing a call — from specifications to making the connections. Eventually, however, the volume of calls grew so much that, short of turning the entire population into operators, there was no way to deal with it. So dials were placed on the telephones and people were told to place the calls themselves.

Of course, it takes expertise to properly operate the phone network or construct applications. There is always the danger of accidentally dialing an 011 and reaching Australia instead of Boston or of calling a 900 number.

But for the most part, people would rather risk an occasional foray to Australia than be encumbered by the services of intermediaries.

A user armed with a spreadsheet might confuse precision with accuracy; a user armed with desktop publishing software might discover new degrees of font abuse. But eventually, most of them will learn how to do what they need to do.

Some users go beyond basic use of the tools; they lash pieces together and pipe data and commands around. This can get exceedingly complex and ugly. Rather than being offended by the amazingly baroque systems that come from these tools, however, we should be impressed by the effort and inventiveness.

We should also pay attention to the message of these constructions: Users can be inventive and apply tools (even beyond their design point) in order to accomplish their tasks.

## The end, not the means

As users learn how to do their own programming, we must become more attentive to what the programming accomplishes and not just focus on the process.

We, too, can use our skills to accomplish a task, rather than writing a program. Rather than "programmer," our business cards might read salesman, architect, journalist, product designer or hydraulic engineer.

Have I taken my own advice? Of course not. I'm still a programmer. But one day I promise to learn a trade.

Frankston has been programming for 30 years and may be too old to change. VisiCalc is his best known program. You can gripe about his opinions by sending mail to CW1@frankston.com.

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# Benchmarks aren't all they would have us believe

MURRAY STEIN

Did you buy your last car because of its horsepower rating? Does a pro football scout automatically sign anyone who can run a 4.3 40? Has the world's fastest human ever won the decathalon?

If you answered no to any of the above, chances are you already understand what many computer marketers don't: Computer users want balanced performance, not just MIPS, MFLOPS or even SPECmarks.

I'm not even going to open the can of worms regarding the relative validity of various benchmarks. A few years ago, people started saying MIPS weren't a fair gauge of CPU speed, so MIPS were replaced by SPECmarks. Now the SPECmarks rating is taking flak because it isn't perfect either.

But who's kidding whom? When it comes to performance evaluation, absolute objectivity isn't possible — and it's not necessary. People who use computers in their work know that overall system performance in their application is what's relevant, not a single performance number.

## Making the cut

What's becoming clearer and clearer to computer buyers is that a benchmark is only useful as a ballpark estimate. It can tell you within an order of magnitude how fast a system is compared with other systems running the same test, and that can help you shorten your prospective vendor list.

How does a system's I/O performance stack up? Processing speed won't get you far if the I/O is terrible.

And is the system optimized for your application? A computer that has a rocket of a CPU can still be as slow as a swamp turtle when it comes to actual transaction speed because the hardware, the operating system or the network hasn't been tuned to the application.

The questions can go on until the mind boggles. And the frustrating fact is that every benchmark number — MIPS, SPECmarks, megabytes per second, greps, nperf, you name it — tells you precious little about the one thing you really want to know: how the system handles your particular application.

There isn't even a consistent correlation between types of applications and performance benchmarks.

## Trial and error

No, there's no way around it: The only way to get a clear sense of how a system will perform in running your application is to load your application or its nearest facsimile on the system in question and try it out. Or look for systems vendors that design and tune their computers to run applications rather than benchmarks.

Unfortunately, such an orientation is rare today. Page through any technology-oriented magazine and you'll see the ads and the claims — faster than a speeding bullet, more SPECmarks than a locomotive, able to crunch large data sets in a single clock cycle.

Some would no doubt say this focus on numbers is an attempt to exploit the ignorant, the way a stereo salesman touts watts per channel to the rich novice. I don't go that far.

I simply say that benchmarks are a distraction as well as a means of avoiding the difficult fact that computers, like people or even like cars, are complex machines.

> COMPUTER USERS know that overall system performance in their application is what's relevant, not a single performance number.

In fact, maybe there's something in that comparison. Perhaps computer vendors, like automakers, should be required by law to warn consumers that "actual performance may vary."

Stein is a computer technology consultant at PointSource Communications in Prescott, Ariz., and a frustrated equipment purchaser.

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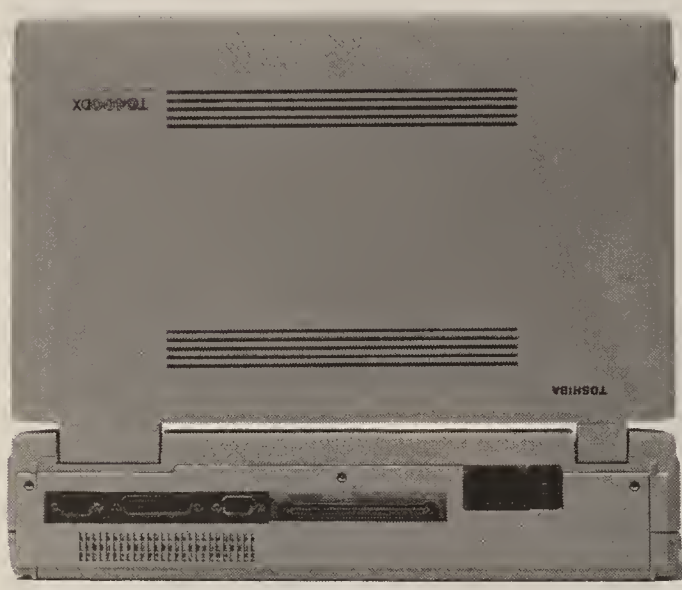
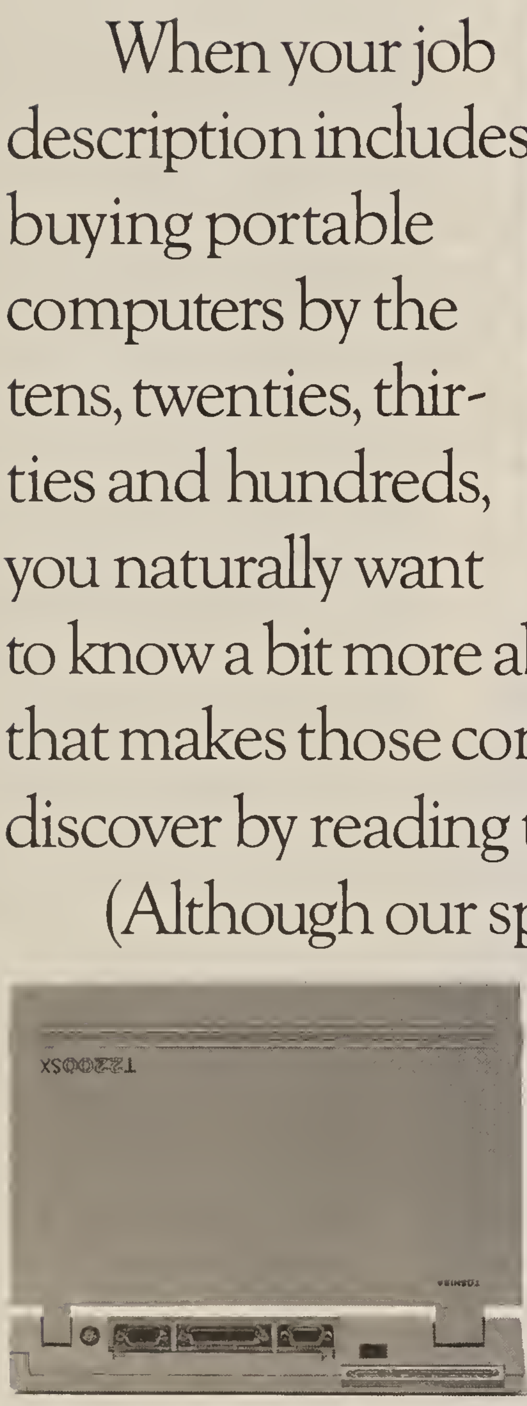


T6400DX

When your job description includes buying portable computers by the tens, twenties, thirties and hundreds, you naturally want to know a bit more about the company that makes those computers than you'll discover by reading their spec sheets.

(Although our spec sheets do make excellent reading.)



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T3300SL/120 MB

Each portable computer in our line has been engineered for easy integration into your existing system—providing all the important ports you need, in addition to the unique expandability option of our DeskStation IV, which comes complete with everything necessary to turn your Toshiba portable into a desktop computer.

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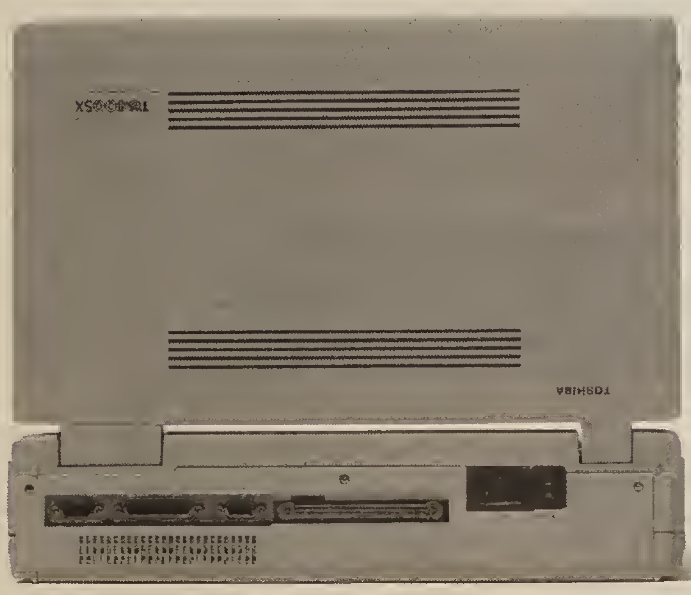
For example, every one of our portables comes with our standard international warranty, covering parts and labor for one year in 24 countries worldwide.

T6400SX


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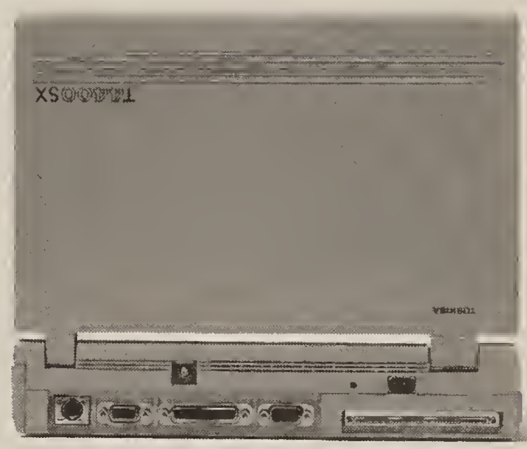
T4400SX/Gas Plasma

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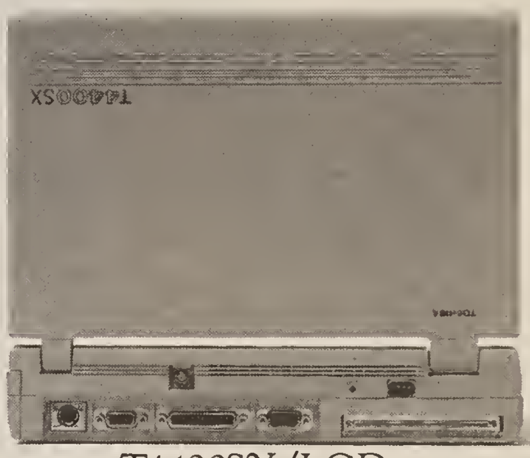
T4400SX/LCD

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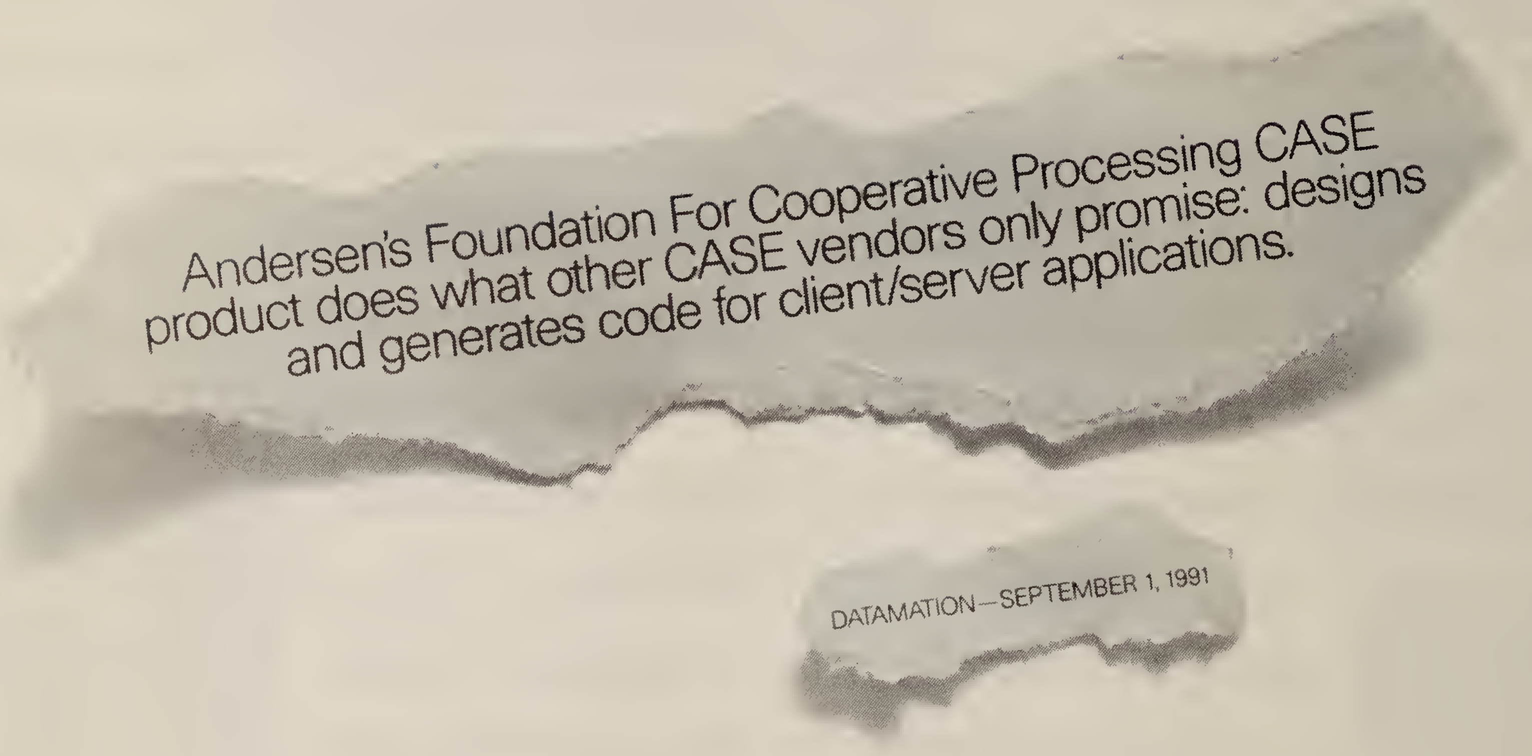

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DATAMATION—SEPTEMBER 1, 1991

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# Notebook computers are tools of the trade at New York Life

**ON SITE**

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — It has been just three years since New York Life Insurance Co. racked up its first computer-driven policy sale. But what a three years it has been.

From those modest beginnings, New York Life's notebook computer-based sales automation effort has grown to include 8,000 of the firm's 9,000 agents. The volume of computer sales has jumped from less than 1% in 1989 to more than 30% today.

That totals more than 13,000 policies during the last month alone, according to Richard E. Nelson Jr., vice president of agency systems.

The foundation of the automated sales effort is a combination customized and off-the-shelf package called NYLexpress, or New York Life Expert Resource Sales and Service, which the company began developing four years ago.

NYLexpress puts a variety of sales tools at the agents' fingertips for use in calculating premiums, estimating benefits and calculating options. The biggest benefit of the software is that it allows agents to close the deal earlier in the sales cycle without getting stuck in the "I'll get back to you on that" cycle.

> IN 1993, New York Life expects that more than 50% of its policies will be sold and processed electronically.

The current NYLexpress barely resembles the initial release of 1989. Based on Microsoft Corp.'s Windows 2.0, that release's two applications consumed 20M bytes of hard disk space.

Today, five insurance applications are installed on the notebooks, spanning the entire selling cycle. They occupy almost 60M bytes of hard disk space. Some 4,000 New York Life agents use luggable portables — largely Prospeeds from NEC Technologies, Inc. — but are shifting to notebooks as storage capacities approach that of the luggables.

New York Life has both homegrown and third-party applications and has spent much of its effort tying them together. The system now automatically updates relevant information, such as customer records, across software modules through the use of a central database.

In-house work is done using Nantucket Corp.'s Clipper and dBase from Borland International, Inc.

New York Life chose a crude version of Windows in 1988 because information systems management thought it would grow with the applications, Nelson said. He opted for a steady "one-piece-at-a-time" development approach.

The agents have driven much

*Continued on page 47*

### Insurance on the go

*N.Y. Life has steadily increased its applications portfolio since it introduced portables to its agents in 1989*

| | June 1989 | June 1992 |
|---|---|---|
| Base laptop unit | Zenith Data's Turbosport | NEC's Ultralite 25 SL/25C |
| Chip | 386 | 386 SL |
| MHz | 16 | 25 |
| RAM | 640K bytes | 4M bytes |
| Hard drive | 40M bytes | 120M bytes |
| DOS version | 3.0 | 5.0 |
| Windows version | 2.0 | 3.0 |
| Sales products covered by software | 2 | 9 |
| Software size | 25M bytes | 65M bytes |
| Number of offices using | 2 | 171 |
| Applications processed (per month) | 30 | 13,563 |

CW Chart: Janell Genovese

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# Suite success puts new pressure on software vendors

## *But corporate customers love the price tag*

BY ROSEMARY HAMILTON
CW STAFF

There is a lot more to application suites than their pretty packages.

Suite sales, which are now the source of fierce competition between Lotus Development Corp. and Microsoft Corp., are fundamentally changing the way some customers buy software and vendors make money.

"I think suites are great for us," said Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York. "The price [of an application] vs. the perceived benefit is often too much for people to try it. If the price is cheap, users can really understand the value."

### What a bargain

For customers, suites require a far broader commitment to a single vendor than many have made before, but they also give them a bargain-basement price that is hard to beat.

Microsoft and Lotus are now offering four-application suites at a list price that is half the software's total value in pieces. Some customers recently contacted said locking in with a particular vendor is less of an issue these days because the competing product lines have increasingly added similar features. More importantly, it reduces support hassles by reducing the number of contacts.

Jude Gartland, a senior vice president at Shearson Lehman Brothers, Inc. in New York, said selecting a suite is a "matter of which horse you are going to bet on," but it is less likely that you will make a bad choice. His company has purchased suites from Microsoft and Lotus.

"I think you can just about flip a coin on this now. Whichever spreadsheet you think is the best now, it could be just the opposite a year from now," Gartland said.

For software suppliers, however, suites are not so sweet — at least for the near future as they drive down the per-application revenue.

With suites, the market share game is no longer about piling up unit sales alone. Instead, the idea is to bring in customers who commit to not one but several applications and will hopefully provide a bigger per-customer revenue stream over several years.

This idea is appealing enough to have spurred intense competition between the two personal computer software giants. Microsoft launched the market nearly three years ago with the first release of Office and pushed ahead with no real competition until April of this year, when Lotus introduced Smartsuite.

Robert Weiler, a senior vice president at Lotus, said Microsoft essentially called the shots on Smartsuite's pricing. With Office established in the market at $750, Lotus came in at $795, even though Weiler said the applications could have easily sold for $895 as a packaged deal.

### Cheaper in volume

*Software suites are selling well, but low prices are pressuring vendor margins*

| Lotus | | Microsoft | |
|---|---|---|---|
| 1-2-3 for Windows | $595 | Excel | $495 |
| Ami Pro for Windows | $495 | Word for Windows | $495 |
| Freelance Graphics for Windows | $495 | Powerpoint | $495 |
| CC:Mail | $84 | Mail | $69* |
| Total | $1,669 | Total | $1,554 |
| Smartsuite | $795 | Office | $750 |

*estimate from 10-node package

Meanwhile, Borland International, Inc. and WordPerfect Corp. are reportedly engaged in discussions to bundle their applications in a suite.

Observers said suites are currently selling for as little as a few hundred dollars. Corporate Software, Inc., a reseller based in Canton, Mass., said it offers an upgrade deal to customers of any Lotus application to Lotus Smartsuite for $319.

"It will be tough for [vendors] to sustain margins that they've gotten used to," said Tim McCollum, an analyst at Dean Witter Reynolds. "They have to learn to live in a different model of business, just like the hardware companies."

As an example, Corporate Software released second-quarter financial results earlier this month that showed an impressive 37% increase in revenue to $71.6 million but a 13% drop in profits to $1 million. The company attributed the lower profits to "a decline in gross margin resulting from lower average unit prices, particularly in the [Microsoft] Windows area."

"We offer [technical] services to our customers, so we make up some money that way," said Ed McGuiggan, corporate accounts product manager. "Also, there's an opportunity in that the customer is purchasing three applications, and we are very much involved in the upgrade business."

### Lengthy relationship

Lotus Vice President Frank Ingari said suites represent a "change in the nature of our business and a more mature market.

"We look at customers in terms of having a long-term relationship with them, and I expect to get some money from them each year as opposed to trying to get the total value the first time you sell a box and then forget about it," Ingari added.

"As long as you are selecting from a group of vendors who are strong and are going to be here for the long term, I don't see a terrible disadvantage to suites," Goldman said.

Yet not all customers are convinced. Jeff Newman, an assistant vice president at Barclays Bank PLC in New York, said the suite prices are impressive, but "I haven't spoken to anyone here who needs all of that software at once. People are still mixing and matching."

WINDOWS VIEW

*Jesse Berst*

# SOS to the rescue

Call it Windows' dirty little secret.

The Microsoft operating environment makes life easier for end users. But it makes life a lot harder for your technical support staff. Windows users typically work with multiple programs, making problems more complex to diagnose. Windows also pushes computer resources to the limit. Troublesome configurations or system bottlenecks quickly show up.

"It is tough to make all these programs live together when you start using Windows with DOS with memory managers and so on," explains Martin Fox, a technical officer at Chemical Bank.

Fortunately, a new CD-ROM product called Support On Site (SOS) lightens some of the work load. Fox, who supports 800 workstations and several LANs with a staff of five, tested SOS prior to its official release in April and continues to use it.

"This information is gold when it comes to configuring and troubleshooting," he says.

Produced by Ziff-Davis' Computer Library Group, SOS provides a single source for information on products from many different vendors. I've had a chance to look it over, and I think it deserves consideration by corporate help desks.

The quality of a reference tool depends on the quality of the data. Ziff went right to the source for the information on SOS. It contacted leading manufacturers (including Microsoft) and obtained documentation, technical notes, bug fixes and other support information. To that it added the text of technical newsletters and books. Then it indexed it and put it all on a CD-ROM together with a search-and-retrieve engine.

### Cutting costs

Much of the information on SOS is also available from the CompuServe on-line service. If you need only occasional help, that's the cheapest way to go. But CompuServe charges by the minute. If your technicians spend much time there, the monthly fees quickly add up to hundreds or even thousands of dollars. Even if you throw in $750 for the cost of a CD-ROM drive, you can still get started with SOS for less than $2,000. At that price, it should easily pay for itself if it saves your support staff 40 hours during the first year.

When I set out to write this column, I intended to compare and contrast two separate products. Unfortunately, one of the two companies has apparently gone under. M'aidez, maker of a similar CD-ROM product called HelpDisq, is no longer answering its phones (at least when I tried). HelpDisq was distinguished by its exclusive focus on Windows products and by its native Windows interface.

By contrast, SOS still labors under a clunky DOS interface. Although Fox says he likes it, I don't. I think it is cumbersome and old-fashioned. Fortunately, Ziff is working on Windows and Macintosh interfaces for shipment late this year.

SOS is a bit pricey at $1,295 for the single-user version and $4,995 for a five-person concurrent license. Remember, though, that the price includes 12 monthly updates. For instance, after Windows 3.1 was introduced in April, the May SOS update already had several hundred tech notes about 3.1.

In addition, Ziff is signing up new manufacturers as fast as it can, so each monthly disk usually adds some new products. SOS already supports several dozen DOS and Windows programs. OS/2 support will appear soon, and the company hopes to have Macintosh support by the fall.

Judging by the experience of Fox, you may save that much time in the first month or two. "When it's time to solve a problem," he says, "we make the CD-ROM our first line of defense."

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Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

# Sales automation key target for Snap

BY CAROL HILDEBRAND
CW STAFF

With Version 5.0 of Snap sales automation software, the Snap Software Group of Sales Technologies, Inc. hopes to tap into what it sees as a market poised for takeoff.

The company, which is owned by The Dun & Bradstreet Corp., is aiming its namesake product at automating, organizing and integrating sales and marketing and service information.

Divided into six sections, the package allows a firm's sales and marketing teams to track clients and contacts. The sections start with General Information, which has phone numbers, addresses and other account information. The Contacts section lists every contact at a particular company whom sales and marketing have talked to. The Activity section lists the entire history of a particular account.

The Comments module allows free-form textual comments to be entered about an account, and the Products section catalogs sales and leads by company. A Ticklers component stores a package of follow-up items.

Jim Leavey, the company's chief executive officer, said that a recent Harris poll of Fortune 1,000 chief executive officers and chief information officers named sales force automation as its No. 1 project over the next five years.

"IT'S VERY HARD to evangelize a new market when there's not a lot of name recognition there."

CLARE GILLAN
IDC

Clare Gillan, an analyst at International Data Corp. (IDC), said the sales force automation software market is still trying to take off, partly because of the lack of a prominent leading vendor. "It's very hard to evangelize a new market when there's not a lot of name recognition there," she said. IDC estimates the 1991 market for sales force automation software at $100 million.

Gillan also said that technology in the arena tends to lag behind the cutting edge in terms of user interface. Snap has addressed that with a spruced-up look that features pull-down menus and pop-up messages.

Michelle Scott, corporate MIS manager at Raxco in Rockville, Md., pinpointed the interface as the package's biggest plus. A feature called Snapshot lets a user bring up a summary of what is in each of the six sections. "Before, you had to physically go into the section to find out what was in there," she said. "It was like having tunnel vision.

Users can also choose contact and account views, which automatically filter information by whether it has a contact name attached to it. "If you enter something about a product, it will force you to select a contact within the system," Scott said.

Snap Version 5.0 is available now, in either single-user, volume purchase or network licensed version. Pricing is $1,500 per single license, with volume discounts available.

# Fast graphics bus sparks excitement, risk of confusion

*Local bus has board makers rushing to market*

BY MICHAEL FITZGERALD
CW STAFF

The hubbub in the personal computer graphics world these days is echoing from an emerging technology called the local bus that promises big performance boosts for graphics-intensive applications.

"I think it's going to totally revolutionize how graphics work and are used in the workplace and the home," said Jake Richter, chief technologist at Panacea, Inc., a maker of software acceleration tools based in Londonderry, N.H. "It's probably the most important thing that's happened to PC graphics."

"For graphics, it's an absolute must-do," agreed Jon Peddie, president of Jon Peddie Associates, which publishes the "PC Graphics Report" in Oakland, Calif.

In basic terms, the local bus is a shortcut to main memory. In PC systems today, graphics and other subsystems perform slowly because the peripherals and add-in cards that drive these data-intensive applications are connected only indirectly to system memory. This is a particular problem for machines that use the snail-like AT bus for input and output.

A local bus lets peripherals bypass the I/O bus and go directly to main memory, greatly speeding up data movement. Most practical estimates said as much as 133M bytes of data per second can be transferred in a system with a local-bus design. However, Richter said, the AT bus will give perhaps 2M byte/sec.

### Complex concept

But even the technology's supporters concede that the local-bus concept does not easily lend itself to explanation.

"It's very complicated," said J. David Schuler, technical marketing manager for the architecture development laboratory at Intel Corp. in Beaverton, Ore. Intel recently announced its local-bus effort, Peripheral Component Interconnect (PCI).

Several local-bus implementations are available or in progress at laboratories: the new PCI from Intel; the VL bus from the Video Electronics Standards Association (VESA); and several products from small companies such as Opti, Inc.

Under PCI, the motherboard gains a local bus that lets peripherals run faster, but it does not run add-in boards and hence is not expandable, according to analysts. It was designed to work on numerous architectures beyond Intel's, though the silicon is not due out until sometime early next year.

Supporting Intel's initiative are IBM, Compaq Computer Corp., NCR Corp. and Digital Equipment Corp., among others.

The Intel-specific VL bus is already in some systems, largely ones from no-name cloners, and analysts said that numerous systems with the VL bus will appear at Comdex/Fall '92.

A LOCAL BUS lets peripherals bypass the I/O bus and go directly to main memory, greatly speeding up data movement.

Perhaps the major difference between the two is that VESA's VL bus will support add-in cards. Intel will leave the decision to support add-in cards up to the individual systems makers.

The whole issue of the local bus gets confusing in part because the buses do not necessarily conflict. Some companies support both VL and PCI. Opti, which has its own local bus, also supports the VL bus.

Individual vendors have their fingers in different pies, too. For instance, Northgate Computer Systems, Inc. will release a line of systems, the VPX line, in the middle of next month that will offer local-bus architecture using a discrete chip set, a la the Chips and Technologies, Inc. Wingine approach.

Some observers, such as Peddie, said they think that only one of these various flavors of local buses will survive (Peddie is betting on the VL bus). Others said room exists for more than one implementation.

"I think PCI will be the choice for expensive, higher-end systems, such as multimedia systems, while the VL bus will be the consumer-level local-bus solution," Richter said.

One thing everyone agrees on: The local bus will drive application speeds way up.

# Notebooks at New York Life

CONTINUED FROM PAGE 45

of the expansion in software, Nelson said.

"This is an end-user-driven project. We can point at almost every step to where an agent suggested something," he said. Agents have helped keep it alive, too.

"We put versions out we should have been shot for," Nelson said. "We've had lots of failures; we've made some horrible mistakes, but we've survived them because the agents have stuck with us."

Primary problems have been with database integration and speed, he added.

### Honesty is best policy

Agents stuck by NYLexpress, in part because New York Life was honest about problems, according to Nelson.

It did not hurt that the project also had a high-level champion: Executive Vice President Lee Gammill.

Gammill "has been our biggest supporter and our fiercest critic, too," Nelson said. "We couldn't have built this without inside and outside help. And you've got to say thank you to people."

New York Life has had to listen to its agents: They pay $1,500 for the software in addition to the hardware they buy at a discount from the company.

The arrangement is structured in such a way that if the value was not there, the project would fail, Nelson said.

**Vice President Nelson:** *New York Life listens to agents' feedback*

In 1993, New York Life expects that more than 50% of its policies will be sold and processed electronically, according to Nelson. Meanwhile, other efforts in IS have yielded clear benefits.

Nelson, who came to IS from the pension department at New York Life, said the company has been able to reduce the number of field offices from 500 to 175, primarily through IS efficiencies. All the offices have access to New York Life's General Office and Agent Linkage System, he said.

### Make my day

While the product has become much more seamless and is getting used much more — last month, New York Life had its first 1,200 day, when more than 1,200 applications came in electronically — plenty of agents still do not use all the software available to them, according to Nelson.

Nelson approaches that issue with characteristic enthusiasm.

"There are lots of things we can do to expand the use," he said. "A lot more we could do to sell it."

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COMMENTARY

*Chris Lindquist*

# A race worth watching

The operating system race hasn't begun in earnest yet, but Microsoft gunned the engine on Windows NT a couple of weeks ago at the Win32 Professional Developers Conference and gave notice that it will be ready for the chase.

If for no other reason than sheer size, the Win32 Professional Developers Conference was impressive. Like it or not, Microsoft should be commended for being able to lure more than 4,000 developers to San Francisco for a look at an operating system that won't ship commercially for another five to eight months. And most of them seemed to be doing just that — looking.

Microsoft certainly did plenty to aid their investigations, including supplying dozens of hands-on workstations and technical workshops as well as handing out free copies of the development kit of prerelease NT to everyone who showed up. Granted, the DOS and 16-bit Windows support in the prerelease are not up to par, but this was a show dedicated to NT as a 32-bit operating system, not a DOS emulator.

Microsoft needs to prove that NT can work. And it seems strongly committed to making NT work. Microsoft can afford this because it has a long-term goal: If Windows NT can become the de facto operating system of the future, Microsoft's other applications can ride the wave to the tune of billions of dollars.

If you own the operating system, you have an advantage in applications — period. It doesn't matter if the only contact your programmers have is when they eat lunch together; that's still more insight than competitors get. Whether you or I or, more importantly, the Federal Trade Commission thinks that situation is anticompetitive or simply good business is irrelevant at the moment. It's making Microsoft money.

### Counting losses

IBM can't say the same. There are plenty of indications that IBM isn't making much — if any — money on OS/2 2.0. IBM admits that a good number of OS/2s — and some 90% of those sold through its 800 number — are going out the door for $49 as competitive upgrades to Windows. People I've talked to at other software firms say IBM can't begin to cover its development and production costs at that kind of price.

IBM also can't use the argument that selling OS/2 2.0 sets it up for future software sales. For now, at least, IBM doesn't sell much PC software.

So why is IBM pushing so hard? It could be several things: pride; the sheer momentum of a huge development effort; a long-term goal of dominating the operating system market; a desire to control the operating system on every piece of its hardware, thereby making connectivity and integration of pure IBM hardware easier. Whatever it is, you can bet it isn't small-time.

Meanwhile, Microsoft has no high-end operating system. It has DOS and an advanced DOS shell called Windows 3.1. I don't care what Microsoft says — it isn't an operating system.

Windows NT 3.1 is an operating system. You boot to NT. Any DOS prompt you see under NT is an emulated one. Windows NT 3.1 is *not* Version 3.1 of NT, however. This is marketspeak at its purest.

Microsoft is fond of saying that NT is the result of months of work and that much was learned from OS/2 development. So what? It is fundamentally different than anything Microsoft has put on the market before. Sure, the interface looks the same, but putting the same dashboard on a Ford Escort and a Porche 959 does not change the fact that the guts are not of the same world. Calling it Version 3.1 won't make NT any less of a first generation.

For the next few months, IBM will try to get OS/2 2.0 into as many hands as possible, and Microsoft will do its best to keep people in line for NT. And having two companies the likes of IBM and Microsoft beating each other up to gather customers can only be good for users.

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Lindquist is a *Computerworld* staff writer.

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## NEW PRODUCTS

### Peripherals

BusTek Corp. has introduced the BT-545S, a fast Small Computer Systems Interface (SCSI)-2 host adapter.

The product gives up to 10M byte/sec. synchronous and 7M byte/sec. asynchronous SCSI data transfers. The BT-545S was designed for high-speed, I/O-intensive file server and data aquisition environments and for systems running multitasking operating systems such as Unix, Xenix, Novell, Inc.'s NetWare and OS/2. An on-board ROM BIOS from Phoenix Software Associates Ltd. offers single-tasking DOS operations and built-in Format utilities.

BT-545S is 100% IBM XT/AT bus-compatible and can interconnect between IBM Personal Computer/AT bus and SCSI peripheral devices.

The BT-545S costs $449.

**BusTek**
**4151 Burton Drive**
**Santa Clara, Calif. 95054**
**(408) 492-9090**

Maxoptix Corp. has introduced the Tahiti IIM, a multifunction optical disc drive.

Tahiti IIM has a read/write cache buffer to increase data transfer rates of on-line storage applications. Available buffer sizes include 256K, 1M and 4M bytes. With the 4M-byte cache, data transfer rates have been measured up to 2.5M byte/sec., almost doubling the performance of standard 256K-byte buffer configurations in certain applications. Sustained data transfer rates of more than 1M byte/sec. can be supported, and the drive has an "in-form-factor" Small Computer Systems Interface-2 interface to ease system integration.

Tahiti IIM costs $4,045.

**Maxoptix**
**2520 Junction Ave.**
**San Jose, Calif. 95134**
**(408) 954-9700**

Mountain Network Solutions, Inc. has introduced FileSafe TD-250, an internal tape backup system for IBM Classic (AT) Bus and compatible computer systems.

Storing up to 250M bytes of data on a single cartridge, the product uses the QIC-80 format with advanced error recovery and correction techniques. According to the company, the TD-250 can back up 80M bytes of data in approximately 20 minutes and can also connect to the computer through the floppy disk. FileSafe is included with the tape drive, featuring automatic installation, menu or command line operation and on-line, context-sensitive Help screens.

FileSafe TD-250 costs $399.

**Mountain Network Solutions**
**240 E. Hacienda Ave.**
**Campbell, Calif. 95008**
**(408) 379-4300**

### Systems

Future Systems Solutions, Inc. has developed the SpeedCache Plus 4.0.

SpeedCache Plus 4.0 is cache software for compact disc/read-only memory drives and was designed to add speed to both DOS and Microsoft Corp.'s Windows environments. SpeedCache Plus 4.0 boosts the DOS performance by more than 4,000% and Windows by 1,000%, according to the company. This release offers write-back caching, which allows a personal computer to multitask during disk writing, and also features complete DOS device-level compatibility.

SpeedCache Plus 4.0 costs $129.95.

**Future Systems Solutions**
**0420 South 500 East**
**Bluffton, Ind. 46714**
**(219) 447-8204**

### Software application packages

Agfa, the imaging division of Miles, Inc., has started shipping Desktop Styles, a collection of 39 TrueType fonts for Microsoft Corp.'s Windows 3.1 personal computer users.

Agfa TrueType fonts are for use in memos, business letters, proposals, presentations and reports and were designed to improve the quality of electronic and printed communications. This collection consists of TrueType versions of eight fonts resident in the Hewlett-Packard Co. LaserJet III series of printers, for use in the Windows 3.1 environment.

Desktop Styles costs $79.

**Agfa**
**100 Challenger Road**
**Ridgefield Park, N.J. 07660**
**(201) 440-2500**

Above Software, Inc. has introduced Golden Retriever, an information navigator for Microsoft Corp.'s Windows operating environment.

Users can create, store, track and fetch spreadsheets, letters, memos, proposals and a variety of other applications. Spreadsheets, documents and other data files are organized and stored by subject, project, author and address, the same way that a paper document would be filed. File names can be created, and Golden Retriever has a system of pointers that list a file in several folders, under the same or different name, without duplicating the original document.

Golden Retriever costs $99.

**Above Software**
**2698 White Road #200**
**Irvine, Calif. 92714**
**(714) 851-2283**

# Harvard Draw for Windows: Robust, good price

*Technology Analysis — a roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.*

Harvard Draw for Windows 1.0 is a strong illustration package for business users, reviewers said. The product, from Harvard Graphics creator Software Publishing Corp., omits a few design tools found in its high-end competitors, but it costs less.

**Ease of use:** Reviewers noted a few minor quirks in the interface, such as the need to select a tool to resize a highlighted object. Overall, though, they said Harvard Draw is straightforward.

**Drawing/editing capabilities:** Harvard Draw provides a relatively complete tool set, including text wraps, Bezier curves, rotation tools and a good polygon tool. Each illustration can have 99 layers. Missing are some three-dimensional image extrusion tools and Pantone color support.

**Speed:** Reviewers found Harvard Draw to be exceptionally fast, both in drawing functions and in importing other graphics file formats.

**Overall value:** Harvard Draw is a very good value at $595. It costs $100 less than high-end competitors while still offering a fairly robust set of tools and features, combined with outstanding speed.

## Software Publishing's Harvard Draw for Windows 1.0

| Reviews | Ease of use | Drawing/ editing tools | Speed | Documentation | Service and support | Overall value |
|---|---|---|---|---|---|---|
| *Infoworld* 2/10/92 | Very good | Numerous conveniences | Excellent | Very readable | Very good | Very good |
| *PC Magazine* 1/28/92 | Straightforward | Some nifty special effects | Very fast tracing | NC | NC | More affordable |
| *PC Week* 11/11/91 | Awkward for certain tasks | Lacks some text-handling features | Speedy | NC | NC | High-caliber set of features |
| *Byte* 4/92 | Snappy interface | 99 layers | Speedy | NC | NC | Professional |
| *Computer Shopper* 5/92 | Intuitive | Has script language | NC | Extensive but index is abysmal | Competent and pleasant | Solid but short of greatness |
| *PC User* 11/20/91 | Easy text editing | Tepid graphics manipulation | Fast | NC | NC | Heavy price tag |
| **Users** | | | | | | |
| **Mark Allen,** Xenon Projection Services, Inc. | ■■■ | ■■■ | ■■ | ■■ | NC | Output to slides difficult |
| **Bill Brandler,** U.S. Department of Transportation | ■■■ | ■■■ | ■■■■ | ■■■■ | ■■■■ | Works well with Harvard Graphics |
| **Analyst** | | | | | | |
| **Katherine Shelly Pfeiffer,** New Media Research | ■■■■ | ■■■■ | ■■■ | ■■■ | ■■■■ | Very friendly |

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

### Vendor background information

Software Publishing reported revenue of $43.4 million and profits of $4.1 million for the quarter ended March 31. The same quarter in 1991 yielded revenue of $30.5 million and no profit. Michael Kwatinetz at research firm Sanford C. Bernstein rated the company's short-term performance as fair and long-term stability as good.

### Software Publishing responds

*Steve Lane, assistant product planning manager:*

**Ease of use:** We haven't gotten a lot of objections on the resizing tool from end users. However, we will probably change it to make it more consistent with Harvard Graphics.

**Value:** Harvard Draw is competing with the high-end products. We wanted to go out in our first release with an aggressive price.

# Windows Draw: Fine for most users

Business users who need sharp illustrations but do not require professional design tools will welcome Micrografx, Inc.'s Windows Draw 3.0, reviewers said.

**Ease of use:** The product offers a simpler, more intuitive interface than Micrografx's high-end Designer graphics package, reviewers said.

**Drawing/editing capabilities:** Windows Draw includes freehand tools, editing functions such as rotation and text wrapping, and an extensive collection of editable clip art. It lacks support for printing cyan, magenta, yellow and black color separations and has no auto-trace tool.

**Speed:** The program lacks a wireframe drawing mode, which slows some operations. Overall, reviewers said Windows Draw is comparable to other graphics packages in speed.

**Documentation:** There is no quick reference manual, but reviewers said the strong on-line Help compensates for this. Tutorials are included in the user manual.

**Service and support:** Free phone support is available 24 hours a day during the week. Micrografx also offers bulletin board and CompuServe support.

**Overall value:** Priced at $149.95, Windows Draw is an excellent value, reviewers said. Graphics professionals will want to look for more powerful alternatives.

## Micrografx's Windows Draw 3.0

| Reviews | Ease of use | Drawing/ editing tools | Speed | Documentation | Service and support | Overall value |
|---|---|---|---|---|---|---|
| *Infoworld* 12/23/91 | Very good | Satisfying low-end features | Very good | Very good | Very good | Good alternative |
| *PC Magazine* 12/31/91 | Revamped interface | Comprehensive filters | NC | NC | NC | Bargain price |
| *PC Week* 11/11/91 | One of the easiest | Somewhat limited | NC | NC | NC | Affordable |
| *Byte* 4/92 | Intuitive | Ingenious rotation tool | NC | Excellent | NC | Superb value |
| *PC Sources* 2/92 | Unintimidating | Lacks multiple layers | NC | Comprehensive | First-class | Reasonable price |
| *Computer Shopper* 4/92 | Uncluttered | High-end features | No draft mode | Good | NC | Sophisticated |
| **Users** | | | | | | |
| **Greg Friedman,** Southern California Edison Co. | ■■■■ | ■■■■ | ■■■ | ■■■■ | ■■■■ | Very good for occasional user |
| **Randy Dugger,** Tandem Computers, Inc. | ■■■■ | ■■■■ | ■■■ | ■■■ | ■■■■ | Network installation is an ordeal |
| **Analyst** | | | | | | |
| **Katherine Shelly Pfeiffer,** New Media Research | ■■■■ | ■■■ | ■■■■ | ■■ | ■■■■ | A great program |

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

### Vendor background information

Micrografx reported sales of $47.3 million and profits of $5.1 million for the quarter ended March 31. Revenue and profits rose 60% and 24%, respectively, from the same quarter last year. John Maxwell III at Soundview Financial Group rated the company's short-term performance as fair and long-term stability as good.

### Micrografx responds

*Paul Grayson, chairman and chief executive officer:*

**Speed:** There is only one editing mode, which is in full color with all fonts and so forth. We find having a wireframe editing mode is just confusing to the user, and the speed difference is very minute.

**Documentation:** Everything is combined into one very tutorial-oriented manual.

# WORKGROUP COMPUTING

LANs • SERVERS • SOFTWARE FOR GROUPS

IN BRIEF

## Goal revises training tool

- **Goal Systems International, Inc.** in Columbus, Ohio, released improved versions of its automated training tool for microcomputer and local-area network platforms. Both Phoenix/Micro and Phoenix/LAN Versions 7.3 include improved graphics and better reporting capabilities, the company said.

- **Best Power Technology, Inc.** in Necedah, Wis., is working on two uninterruptible power supply products that support Simple Network Management Protocol. The products are based on its CheckUPS II power monitoring and unattended shutdown software for **Novell, Inc.**'s NetWare Management System.

- **Volkswagen AG**, **Intergraph Corp.** and **Control Data Systems, Inc.** signed a joint marketing and technology deal for developing engineering systems for the automotive, aerospace and discrete manufacturing markets. The engineering systems will use a consistent product data model that will be accessed by design, engineering and manufacturing groups.

# IBM, Chipcom form superhub partnership

*The two companies will pool resources to develop, market and build multiprotocol hub products*

BY JOANIE M. WEXLER
CW STAFF

RALEIGH, N.C. — IBM's little-known efforts to migrate its Token Ring customers to multimedia applications got a shot in the arm from the firm's eleventh-hour partnership with smart hub vendor Chipcom Corp. last week.

The two firms roughly outlined an intent to combine worldwide marketing and manufacturing efforts in the "superhub" market, although no product specifics will be announced until year's end, the vendors said.

The term "superhub" refers to smart hub products that allow network administrators to dedicate a full local-area network's bandwidth to each user and switch traffic across a high-speed backplane. The nailed-up bandwidth afforded by switching alleviates the delay-sensitive problems of running multimedia applications over shared-bandwidth LANs.

Superhubs are transitory products to multimedia-oriented Asynchronous Transfer Mode (ATM) networking.

IBM said its relationship with Chipcom forms the foundation of its strategy for entering the ripe multiprotocol hub market — a key product area the industry has been hounding IBM to enter.

"It is because they are so late entering this market that they need to buy into the technology," said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

Until last week, IBM's multimedia migration path consisted of testing and demonstrating desktop videoconferencing applications — such as training videos — running in a client/server scenario within a 16M bit/sec. Token Ring LAN. However, this setup will likely be of limited use, as users could simply run down the hall to meet face-to-face or congregate in a room for a common training session, analysts noted.

Of more likely appeal is a desktop-to-desktop, inter-LAN Token Ring videoconferencing application that the vendor has been testing in "tens of U.S. customer sites" during the past year, said Mike Murphy, the senior planner in IBM's network systems area responsible for the vendor's multimedia strategy. However, the application, dubbed "IBM Person-to-Person," is not yet an announced product and may not be released, Murphy said.

The goal with the Token Ring multimedia efforts — which are happening alongside the firm's development of stand-alone ATM cell switches — is to tide over IBM's large installed Token Ring customer base while higher-speed ATM network infrastructures evolve. IBM said it just passed the 5 million mark in sales of Token Ring adapter cards.

However, an analyst familiar with IBM's strategy said that while the Token Ring architecture outshines those of other shared-bandwidth LANs for carrying voice and video, the industry is more keen on the dedicated LAN approach.

"The IBM Token Ring multimedia efforts are a Band-Aid solution," said Dave Passmore, a vice president in the local-area communications group at Gartner Group, Inc. in Stamford, Conn. "Since ATM switching via the LAN-per-user scenario is not far away, I would recommend they focus their efforts there."

IBM and Chipcom did not specify whether their joint development would include hub-based ATM products, although Chipcom has long advocated the technology. Chipcom and Bytex Corp. are among the hub vendors best positioned for the transition to ATM. Their auto-configuration software allows users to segment networks logically, and they are set up to implement the LAN-per-user form of networking (see story page 55).

Murphy acknowledged that IBM has per-port auto-configuration development in the works, but he did not comment as to whether it is Chipcom or IBM technology.

## A closer look

With its Token Ring-oriented multimedia equipment, IBM has been able to send up to 10 simultaneous 1.2M bit/sec. sessions between client and server within the same 16M bit/sec. Token Ring, said Mike Murphy, the IBM senior planner heading up the company's multimedia efforts.

The same circuitry found on a stand-alone coder/decoder sits on an IBM video card in a Personal System/2, he explained. A camera hooks into a $1,995 IBM Action Media II video card, which includes playback capabilities. A card version allowing users to receive video costs $890, IBM said.

Compression algorithms turn voice and video into digitized data for transport over the LAN. The more predictable token-passing access method of Token Ring networks renders the topology more suitable for such applications, according to Dave Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn.

Passmore also pointed out that the Token Ring standard includes a little-used feature that allows applications to make priority reservations for certain network traffic — a useful feature for implementing delay-sensitive voice and video.

JOANIE M. WEXLER

By the end of this week Computerworld readers will have spent over $46.7 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services, Fall 1991

# Political minefield could sabotage OSF

CONTINUED FROM PAGE 1

erful companies behind the OSF has spurred his own primary vendor and vocal OSF critic — Sun Microsystems, Inc. — into more rapid innovation and product enhancements to counter the OSF's plans.

Yet will the OSF be around for the long term?

Its three largest sponsors — IBM, Digital Equipment Corp. and Hewlett-Packard Co. — are adamant that it will.

They said their commitment to the foundation's future is solid, and their patience with OSF's struggle to reach self-sufficiency will last.

Stella Johnson

**President David Tory** *skippers OSF into a turbulent open systems sea*

### Open space

"If OSF were to go away, I think there would be a significant void" in the open systems market, Saranga said.

"Without OSF there, I would fear fallback to proprietary solutions from the various vendors," said Ted Hanss, chairman of the OSF's end-user steering committee.

Even users who are unimpressed so far by the OSF's product rollout — the Motif graphical user interface and the OSF/1 Unix operating system — acknowledged some of the organization's accomplishments. They include the following:

- Providing a competitive alternative to Unix System Laboratories, Inc. (USL) and Microsoft Corp. for source-level technology.
- Establishing the request for technology process, a collaborative research and development model previously untried in this industry. It enables competing companies to submit products as candidates for inclusion in OSF technologies.
- Encouraging the penetration of Unix into commercial environments.
- Complementing the standards process and spurring further innovation in the Unix market.

"It is not the job of standards to advance technology, but someone does need to get the technologies out there," said Steven Jenkins, a software architecture engineer at Jet Propulsion Laboratories in Pasadena, Calif. "I believe OSF has bitten off some of the really hard problems in distributed computing. It's not coming as fast as anyone would like it, but it's beating the alternatives."

"OSF has done a good job in getting people in this industry to stop killing each other and work in forums," said Chris Stone, president of Object Management Group, Inc. in Framingham, Mass., which counts dozens of OSF members among its 270 member firms. "They've proved they have some staying power."

The anticipated onslaught next year from Microsoft's Windows New Technology (NT) advanced operating system is helping to encourage a more unified front among Unix and open systems vendors these days.

The warming relationship between the OSF and USL — onetime rivals — bears witness to this worry.

"Everybody is just scared spitless of the notion that NT is going to own all the desktops in the world," said Tony Carrato, a member of the OSF's end-user committee and a principal at Mile-High Information Services, Inc., a consultancy in Denver. "If you really look at NT, it does look an awful lot like Unix."

### Search for independents

Users and analysts agreed that a crucial component of the OSF's future viability is its relationship with independent software vendors, who so far have shown only a passing interest in the OSF's activities.

"We would really like to have a coalition of [independent software vendors] similar to the coalition of users at OSF," Hanss said.

*Continued on page 51*

## Kernel, compiler on deck at institute

The OSF Research Institute, with dual headquarters in Cambridge, Mass., and Grenoble, France, also has dual rising stars in its high-tech heavens.

The primary one is the OSF/1 Micro-Kernel, the next generation of the OSF/1 operating system.

The secondary star is a futuristic compiler technology that will enable a single version of a shrink-wrapped software application to run on several different hardware platforms — offering users the ultimate in software portability.

This advanced compiler technology, called ANDF for Architecture Neutral Distribution Format, has been something of a political hotcake at the OSF, however.

"System vendors are still very protective of their software catalogs, and the larger ones are reluctant to level the playing field," said Paul McGuckin, an analyst at Dataquest, Inc.

Two months ago at the foundation's member meeting in Munich, Germany, user members were dismayed to learn that ANDF development was being moved to the back burner at the OSF's European headquarters, largely because of U.S. system vendor indifference. No one at OSF had consulted members of the end-user steering committee about the change in plans.

"They overlooked a valuable channel with us, but they're really bright people. They won't do it again," said Tony Carrato, a member of the end-user committee.

**OSF's Goldstein**

Fortunately for ANDF, USL stepped in with an undisclosed amount of financial support that reinvigorated the flagging development program. Through joint work with OSF and the UK's Defence Research Agency, USL intends to bring out a commercial ANDF product in 1993.

"My goal is that people can invent hardware that does new and wonderful things without the boat anchor of a vast amount of software" to port, said Ira Goldstein, vice president of research and advanced development at OSF.

Of far greater interest to the OSF sponsor companies is the OSF/1 Micro-Kernel. Based on Carnegie Mellon University's Mach 3.0 kernel, the microkernel is a highly secure, scalable version of OSF/1 that is particularly well-suited to massively parallel or clustered high-performance systems. It makes its commercial debut later this year inside the Intel Corp. Paragon supercomputer.

As a stripped-down version of the kernel — with networking, file systems and virtual memory management removed — the microkernel can also run "multiple personalities" or other operating systems such as OS/2 or MS-DOS in the user space above the kernel.

MARYFRAN JOHNSON

## Ready for launching

PASADENA, Calif. — At the Jet Propulsion Laboratories (JPL), everything promised by the OSF's DCE is already working on its 300-node ground data system network.

So why is JPL waiting so anxiously for the OSF's suite of system management tools?

"DCE will actually solve a lot of problems for JPL," said Steven Jenkins, a software architecture engineer at JPL, the part of NASA that does robotic exploration of the solar system. "We invented much of what's in DCE back in the bad old days when you did this stuff yourself, but our solutions aren't necessarily as portable, general or powerful as we'd like them to be."

Built to span multiple platforms running Unix and proprietary operating systems, DCE is a set of services, tools and utilities that enable distributed computing.

"When you look at the problems DCE was set up to solve — remote procedure calls, timing, security, multithreading — those are the big problems we ran into with our network," Jenkins noted.

While there is nothing technically brilliant or ground-breaking about DCE, it does mark the first time an integrated set of these services has been widely accepted as an industry standard — before any product is even available.

Later this year, the DCE technologies will start showing up as layered components in new operating system releases from IBM, DEC, Hewlett-Packard and other vendors.

"Our plans are rather extensive in this area," said Mike Saranga, president of OSF's board of directors and assistant general manager of systems, structures and management at IBM. "DCE will appear in AIX [IBM's Unix variant] this year and in OS/2 and MVS after that."

Yet even more critical than DCE to end users and the OSF sponsors is the follow-on set of system and network management software called the DME.

Although IBM is doing the final integration of DCE, the OSF decided to keep DME work in-house. Foundation officials said they have changed the integration process to avoid some of the snafus with DCE, which is running at least one year late.

"With DCE, there was too much inspection and coordination going on too far downstream in the technology merge process, which slowed down the assimilation of all the different contributions," said Ted Hanss, chairman of the OSF's end-user steering committee. "With DME, they're not trying to do a mass integration but a step-by-step integration, so it's not everything coming together at one point, with all that additional complexity."

MARYFRAN JOHNSON

**Mike Prince**
IS Director
Burlington Coat Factory

*"Confusion over the past few years . . . led to reluctance in embracing open systems."*

**Sheri Anderson**
Senior Vice President of
Production and System Services
Charles Schwab

*The OSF is "becoming more realistic but not less visionary."*

**Tony Carrato**
Principal
Mile-High Information
Services

*"Everybody is just scared spitless of the notion that [Microsoft's Windows] NT is going to own all the desktops in the world."*

*Continued from page 50*

Paul McGuckin, an analyst at Dataquest, Inc., said widespread industry acceptance of the OSF's Distributed Computing Environment (DCE) and Distributed Management Environment (DME) as de facto standards — before anyone is even using the products — is perhaps the most astonishing feat in the organization's brief life span (see story page 50).

### Finding a niche

"I think OSF has found its place as a supplier of much-needed middleware," McGuckin said. "That is where their success will be."

For users, the true test for any new software technology is application deployment and support. At DHL Systems, Inc. in San Mateo, Calif., distributed computing needs are handled today with Sun's Open Network Computing (ONC) products.

"I'm using ONC not only because it's the only choice I have today but because Informix and the third parties are supporting that interface," said John Scharber, manager of hardware and software systems at DHL Systems. "Just having product out there won't be enough; OSF will need it supported by all my vendors."

> *"If OSF were to go away, I think there would be a significant void."*
>
> **Mike Saranga**
> President of the OSF's board of directors and IBM's assistant general manager of systems, structures and management

Users and analysts alike said the OSF's greatest strengths are in its continued work as a technology integrator. They see the foundation as acceptably neutral ground to determine which products have the potential to become de facto standards in mainstream commercial accounts.

If the OSF did not exist, many users said, something like it would still be necessary to develop the consensus among competing vendors needed to achieve open, distributed computing.

"I think they've realized that if they don't hang together, it's pretty clear what else will happen," Carrato said.

As the OSF matures, it is facing the common problems of any software supplier, but with some additional burdens. Once products are out the door, customers want maintenance, support and assurance that the technology will keep advancing. At a for-profit company, that scenario calls for growth in the product development groups.

Yet the static size of the OSF — and the uncertainties of its future funding — means that the organization must shift people from the more stabilized technologies, such as Motif and OSF/1, to emerging ones such as DCE and DME.

After the release of OSF/1.1 a few weeks ago, for example, managers began assigning engineers to other projects.

### Changing positions

"If we have a fixed set of resources and we're changing from one technology emphasis to another, those resources change, too," OSF President David Tory said.

Such changes require the OSF to rely increasingly on the resources of its sponsors, who are now being asked to provide more help in the way of engineering, testing and quality assurance.

"I think OSF is learning a lot about delivering products and working with customers," said Sheri Anderson, senior vice president of production and system services at Charles Schwab & Co. in San Francisco. "They're becoming more realistic but not less visionary."

"The time has arrived to deliver on the promises," added Warren Hoffman, a principal consultant at Du Pont Co. in Wilmington, Del. "We don't want it to drag into 1995."

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## NEW PRODUCTS

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Raxco has released Bart, a backup and recovery software package for Unix networks.

Bart is a high-speed backup technology designed for heterogeneous networks that have a demand for interoperability. According to the company, Bart has full network support, reliable file recovery and fast backup capability. Bart can back up any disk on any machine on a Transmission Control Protocol/Internet Protocol network, whether the device is local or remote.

It can also generate on-disk indexes that are used to locate files, eliminating the need to process the entire tape, the company said.

Licensing fees range from $399 to $49,995 depending on configuration.

**Raxco**
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**Rockville, Md. 20850**
**(301) 258-2620**

### Modems

PSI Integration, Inc. has announced the PowerModem 96/96 and the PowerModem 10/42, two internal high-speed fax/data modems designed for the Apple Computer, Inc. Macintosh PowerBook line of computers.

Both products include V.42bis, which enables users to increase throughput of data transmission. With V.42bis, the PowerModem 96/96 can transmit data at speeds of up to 38.4K bit/sec. The PowerModem 10/42 can transmit data at speeds of up to 9.6K bit/sec.

PowerModem 96/96 costs $699, and PowerModem 10/42 costs $399.

**PSI Integration**
**Suite 200**
**851 E. Hamilton Ave.**
**Campbell, Calif. 95008**
**(408) 559-8544**

### Workgroup software applications

Erdas, Inc. has announced Erdas Imagine GIS (geographic information system) and imaging processing software for Digital Equipment Corp.'s DECstation 5000 Model 100 and 200 series workstations.

The product is a fully integrated, application-driven GIS package that allows users to combine, enhance and manipulate data layers to be used in the X/Motif environment. Imagine offers an image viewer, spatial and statistical modeling, a graphical point-and-click user interface and advanced image processing. A Map Composer is included, and users have the ability to view images at any scale.

Prices start at $10,000.

**Erdas**
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### Electronic mail

NBS Systems, Inc. has introduced Enterprise E-Mail Systems, a line of integrated mainframe-based and local-area network-based electronic-mail systems.

The Total Office Support System (TOSS) series of client/server-architected E-mail systems consists of TOSS/Lan, TOSS/Ws, TOSS/PC and TOSS/Host. TOSS/Lan is a system server that provides E-mail among individuals in any size workgroup. TOSS/Ws provides a Microsoft Corp. Windows interface for users accessing either TOSS/Lan or TOSS/Host servers and runs under native MS/DOS, Windows, Unix and OS/2. TOSS/PC provides a Windows-type interface for personal computer off-line operation.

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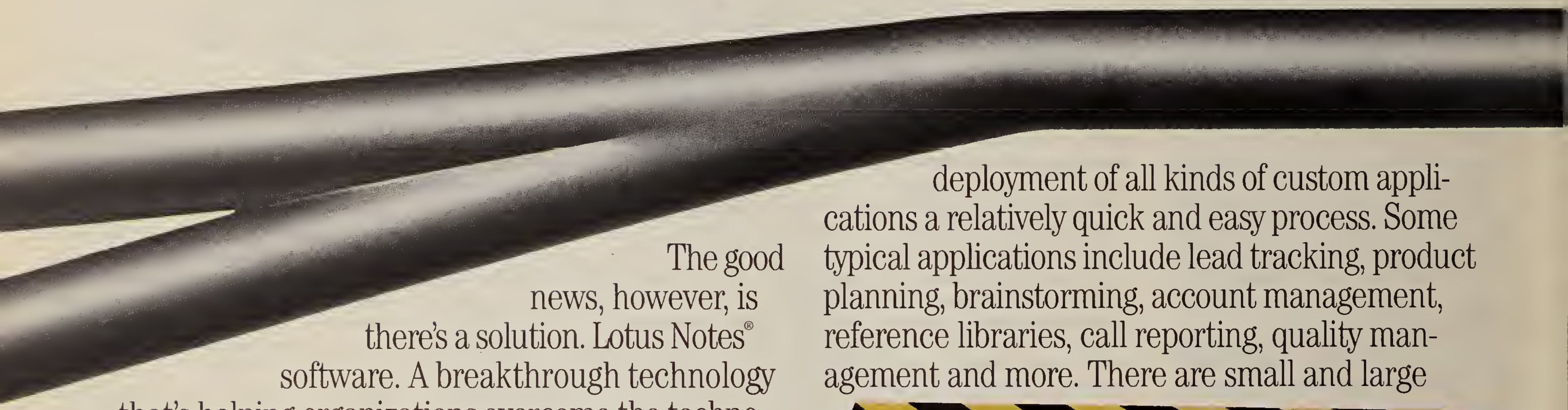

The good news, however, is there's a solution. Lotus Notes® software. A breakthrough technology that's helping organizations overcome the technological roadblocks found in most mixed computing environments, which often stop good ideas from ever going anywhere.

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What's more, Notes is an extremely flexible environment that makes the development and deployment of all kinds of custom applications a relatively quick and easy process. Some typical applications include lead tracking, product planning, brainstorming, account management, reference libraries, call reporting, quality management and more. There are small and large companies, in fact, that have bought Notes to solve a specific problem, only to discover that it answered other needs as well.

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# ENTERPRISE NETWORKING

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COMMENTARY

*Elisabeth Horwitt*

## Internet users unite

While Democrats went through the motions of choosing a presidential candidate in New York earlier this month, classic democratic consensus-seeking was taking place at the Internet Engineering Task Force (IETF) meeting as some 700 vendors, developers and users argued and schmoozed their way to agreement on proposed enhancements of TCP/IP, SNMP and related protocols.

Internet users tend to be technically savvy types from the engineering, vendor, academic and government communities. They tend to have ponytails and wear jeans and work shirts, not business suits.

Executives from DEC and other big companies, along with the engineering user types, put off their company manners, put on their work shirts, rolled up their sleeves and got some important business done at this meeting.

### Active participants

The amount accomplished was particularly impressive given the number of people involved. The IETF standards-setting process is open to the whole Internet community, which numbers hundreds of thousands if not millions.

Unlike more sedate standards bodies, such as the ISO, you do not have to pay exorbitant membership fees or attend meetings all over the globe in order to have a hand in the standards process.

As one member pointed out to me, IETF keeps its meetings open to all, has no membership fees and charges a bare minimum — $130 — for a five-day conference.

Furthermore, anyone who has an Internet mailbox — or a gateway to the Internet E-mail system — is welcome to put in their 2 cents worth about a proposed new standard or enhancement.

You'd think this huge, loosely knit community would never get anything done, particularly since the governing bodies, such as the Internet Advisory Board, can only recommend courses of

*Continued on page 58*

## Distributed computing drives support costs

*Managers cite network complexity as reason*

BY JOANIE M. WEXLER
CW STAFF

FRAMINGHAM, Mass. — The proliferation of distributed computing environments and client/server applications is making organizations increasingly dependent on enterprise networks. Managers are now investing more heavily in internal and external network support, according to a recent study by Dataquest/Ledgeway Group, a research firm based here.

The driver behind the growing network support investments (see chart) is the confounding array of communications challenges that are springing up. These range from evaluating new internetworking technologies needed to create enterprise networks to tracking, managing and leveraging far-flung corporate data.

"There are too many products, vendors and technologies" for firms to juggle single-handedly, said Jeff Kaplan, a director at the firm, which surveyed information services and networking managers in 500 large organizations for its annual network support revenue forecast.

Dataquest/Ledgeway calculated that the worldwide network support market reached $16 billion at the end of last year and predicted a near-20% compound annual growth rate for the next five years.

Kaplan estimated that one-third of these budgets could be attributed to management issues associated with distributed computing.

"Companies are fortifying their support capabilities at all levels," but in particular, they are "trying to offload the routine work so that they can focus on higher level planning and design issues, which are more strategic," he said.

### Looking outside

Such is the case at Brown and Caldwell Consulting in Pleasant Hill, Calif. "We go outside heavily for maintenance and reliability services," said Jim Smith, manager of information services at the environmental consulting firm. "We try to do our own visionary planning because we're closest to the business. An outsider would have a tremendous learning curve."

Smith, who contracted early in the year with value-added reseller The Asset Group in Houston for ongoing network maintenance, estimated that his budget for outside support will indefinitely constitute at least 10% of the cost of his installed network equipment base.

The main reasons, Smith said, are "the complexity of the networking environment today" and the nationally dispersed nature of his company, which precludes keeping up-to-date networking personnel on the corporate payroll everywhere they are needed.

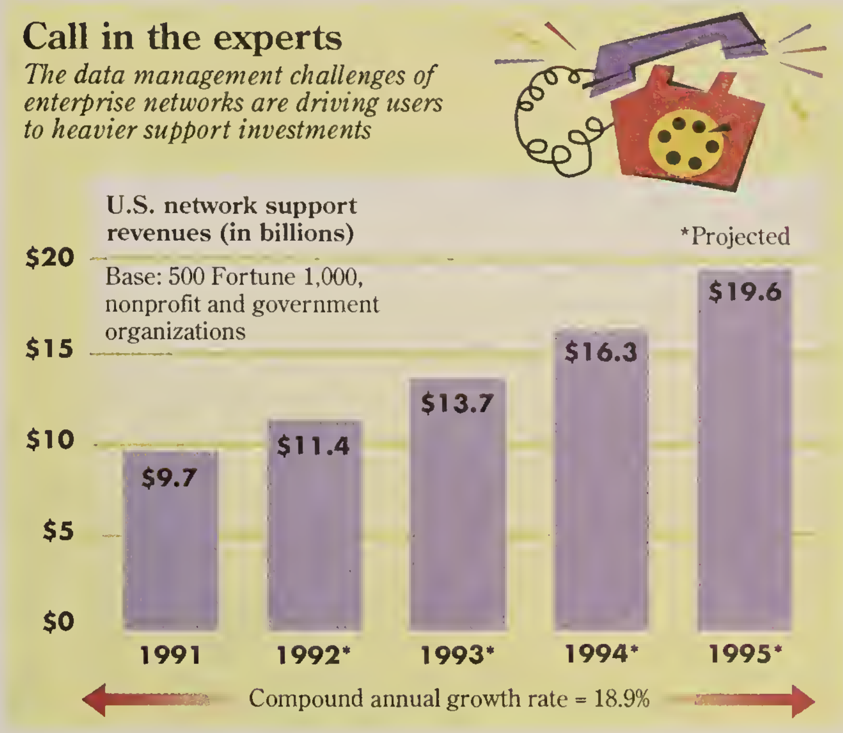
The magnitude of these and other issues is also the rationale behind the many vendor alliances that have cropped up during the last couple of years, according to Kaplan.

"Ironically, the smaller [vendor] companies that really understand technology, such as the router companies, don't have the field staffs in place" to solely provide their customers with the end-to-end support they need, Kaplan said. Conversely, vendors with the more sweeping support staffs "don't understand the technology," he added.

Users, then, must pool their own resources with vendor and other support sources to handle the job, he said.

**Call in the experts**

*The data management challenges of enterprise networks are driving users to heavier support investments*



Source: Dataquest/Ledgeway Group

CW Chart: Stephanie Faucher

## Slow migration to ATM expected

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Even those hailing Asynchronous Transfer Mode (ATM) as the Holy Grail of networks acknowledge that large-scale migration to the technology will be hampered by users' existing investments in Ethernets, Token Rings and other local-area networks.

ATM took its initial product form earlier this month with the rollout of a local-area switch from Adaptive Corp. [CW, July 13].

Existing LANs will continue to serve many corporate networking needs far into the future, users and analysts contend, rendering initial ATM installations more prominent as a backbone technology that is more scalable than the emerging, 100M bit/sec. Fiber Distributed Data Interface LAN.

ATM is a gigabit-speed-capable technology that will expand proportionally as computer speeds rise, freeing network managers from continually segmenting and otherwise fiddling with networks as they become bottlenecks. ATM is under construction as industry-standard glue that will eventually eliminate the boundaries between LANs and wide-area networks.

Meanwhile, some users said traditional shared-medium LANs can be tweaked to deliver some capabilities afforded by ATM. This includes software-based network configuration already inherent in smart wiring hubs from Bytex Corp. and Chipcom Corp. These auto-configuration capabilities allow administrators to cut and paste network nodes among workgroups without having to physically rewire.

ATM technology takes these hub functions a step further by building temporary, point-to-point, secure network connections during a transfer at full network speeds — a feature expected from hub maker Ungermann-Bass, Inc. at year's end. In addition, in ATM mode, physically moved nodes automatically pop up on their virtual workgroup with no new addressing or management required.

### Keeping the faith

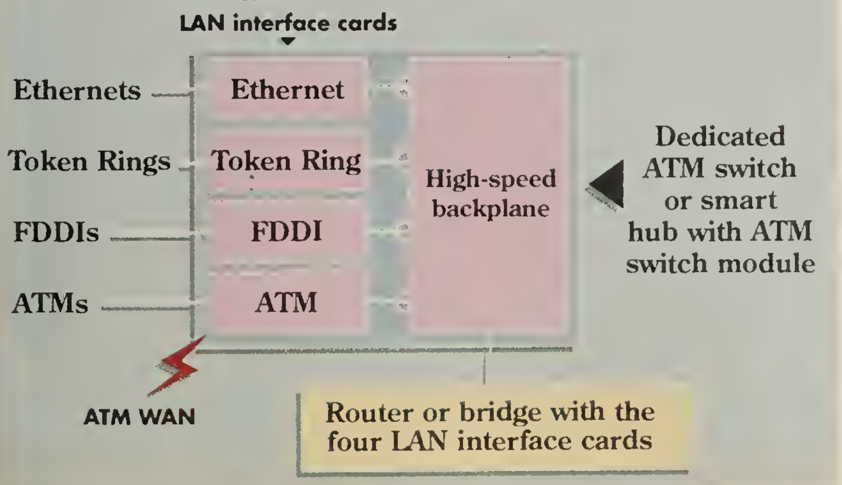
While timing-sensitive multimedia is often cited as the driver behind ATM, some users trust their existing LANs to support those applications.

"Multimedia running between a PC and local server works just fine over Token Ring," said Mark Roy, network operations consultant at John Hancock Mutual Life Insurance Co. in Boston. "It's when you run multimedia across the internetwork — where you're aggregating traffic in bridges and routers — that you need the high bandwidth and isochronous char-

*Continued on page 58*

**Local hero**

*Migration to ATM network infrastructures will be complex as users blend ATM technology with their existing LANs*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IBM

# TCP/IP suits them fine

The participants at last week's IETF conference had one common purpose: to ensure that TCP/IP and SNMP continue to be effective means of keeping their international, multivendor systems interoperating.

The possibility of using OSI protocols instead did not even seem to enter members' heads. TCP/IP suits them just fine.

"There is no evidence of a mass migration to OSI in the Internet community," said David Crocker, principal at Sunnyvale, Calif., consulting firm The Branch Office. "People only make changes when there is a big benefit."

This tendency among users to cleave to TCP/IP, which analysts began noticing a couple of years ago, shows no signs of going away, according to a report that Business Research Group plans to release this week.

A survey of 400 corporate sites found that OSI now constitutes less than 2% of users' overall traffic and is expected to reach just under 4% in two years, the Newton, Mass., research firm said. In contrast, TCP/IP traffic makes up 15% of total traffic today and is expected to make up almost 23% in two years.

And despite the Government OSI Program that mandates OSI for government agencies and contractors, the 60 government sites surveyed by Business Research Group reported a very similar breakdown of TCP/IP and OSI use, said Kevin O'Neill, the firm's vice president of research.

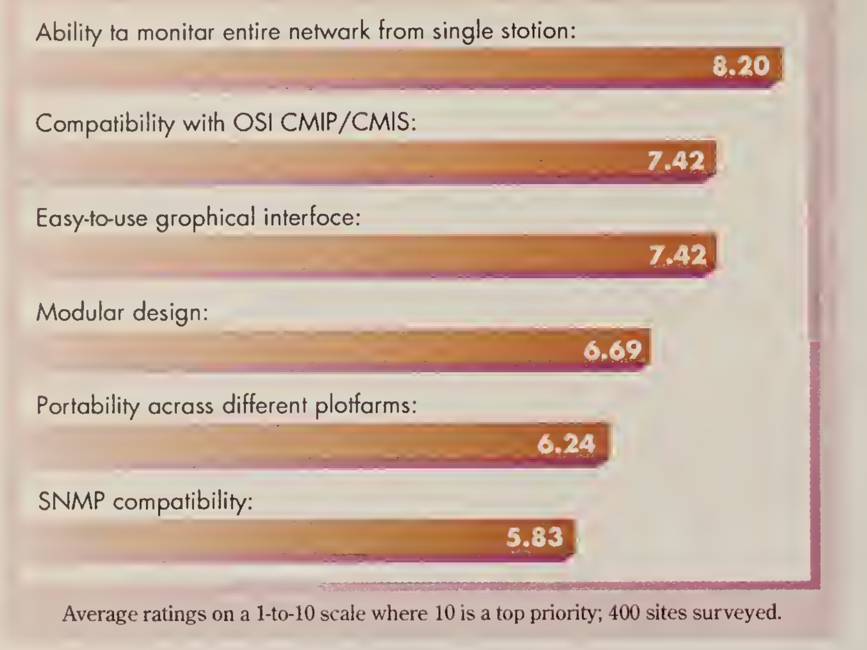
But users placed a much higher priority on OSI Common Management Information Protocol (CMIP) than on SNMP for future integrated network management systems, the study found.

SNMP installations currently abound, while CMIP installations — and products — are scarce, according to several recent studies. But many users still look to CMIP for the future, O'Neill said.

ELISABETH HORWITT

**Keep it simple**

*Users rate central monitoring and OSI compatibility as their top network management priorities*



Average ratings on a 1-to-10 scale where 10 is a top priority; 400 sites surveyed.

Source: Business Research Group, Inc. CW Chart: Stephanie Faucher

# Horwitt

CONTINUED FROM PAGE 55

action, which the community can turn down. Indeed, the community did just that with a recent board recommendation to accept its chosen scheme for a new TCP/IP addressing scheme, without the usual months-long debate of possible alternatives.

And yet IETF members continue to bring out working, commercially successful network and network management standards on a regular basis, while "formal" standards bodies such as the ISO are still bogged down in vendor politics and debate over technical niceties.

Attending one IETF "birds of a feather" session is enough to show why.

At this particular session, four developers were presenting SMP, a potential successor to SNMP. Advance press on SMP, coupled with some nasty rumors that the developers would bypass the formal IETF approval process, meant that some people came to the meeting with chips on their shoulders.

However, the informal consensus of those attending the meeting was that the IETF should start working on refining and finalizing SMP as soon as it is practical to do so.

A major reason why the presentation went so well is that the developers are major SNMP developers with a long list of credits and a lot of power in the IETF community.

In addition, the developers wisely emphasized that they would not push their proposal as a standard until the community has had a chance to go over it thoroughly and make recommendations for changes and additions. This is in accordance with the IETF philosophy of standards-making, which is to "let a thousand flowers [or proposals] bloom" and then turn them over to the Internet community and the market to determine what survives.

### Putting it aside

What really makes the IETF an effective body, though, is members' willingness to bury hatchets and put aside egos and organizational politics in order to get things done.

"A lot of former SMP opponents spoke for the protocol" once they had seen the presentation, IETF board member Chuck Davin says. "People may not be 100% in love with SMP, but when the chips are down, they are very committed to ensuring interoperability" across different network management systems.

When the chips are down, these standards setters are more concerned with getting the best standards they can in a timely fashion.

Perhaps that is because the majority of them are users — not vendors or standards body officials.

Horwitt is a *Computerworld* senior editor, networking.

# Slow migration to ATM expected

CONTINUED FROM PAGE 55

acteristics of ATM."

Isochronous capabilities — inherent today only in cell-switching technology such as ATM — guarantee that the equal-length traffic packets arrive at their destination in a steady, deterministic fashion. The characteristic is important for voice and video traffic, which would otherwise be erratic and incomprehensible.

IBM supported Roy's assertion, saying it has tested videoconferencing applications over its 16M bit/sec. Token Ring network in a client/server scenario. The technology "runs fine until traffic reaches about the 90% network utilization range," said Mike Murphy, an IBM senior planner responsible for the firm's multimedia strategy.

### Video Token Ring

In addition, cooperative efforts between Bytex and "the Top 2 videoconferencing vendors" — presumably Picturetel Corp. and Compression Laboratories, Inc. — are under way to outfit installed Token Rings with video mechanisms, according to William S. Starner, Bytex corporate vice president of product marketing.

He said Bytex intends to bring its auto-configuration capability to the table to allow users to be cut and pasted on and off a physical Token Ring dedicated to video.

Roy said that it was "with an eye toward ATM" that Hancock invested in the Bytex LAN hub and Wellfleet Communications, Inc. routers. The Bytex hub's software configuration capabilities "allow us to manage our workstation infrastructure" in a manner that is a forerunner to ATM, he said, and the Wellfleet router has the backplane capacity needed to aggregate the hefty volumes of internetwork traffic that will be driven by multimedia.

Hubs and routers will be ATM migration catalysts as they gain interfaces allowing ATM to coexist with other LANs (see story below).

# Vendors smooth path to ATM

Internetworking vendors are moving into position to help migrate their customers' hodgepodge of installed networks to a smooth ATM infrastructure.

Retix, for example, has already introduced an ATM interface for its just-released RouterXchange 7000 multiprotocol router. Router market leaders Cisco Systems, Inc. and Wellfleet said such interfaces are imminent and have plans to also introduce full-blown ATM switches in the future [CW, June 29].

On the hub vendor side, Ungermann-Bass, Inc. has said it will deliver ATM switching within its Access/One hub by early next year.

Chipcom Corp. said its short-term goals are to outfit its On-line Concentrator hub with an ATM interface "to add ATM LAN support and bring ATM-like function to existing Ethernets and other LANs. A natural progression to an ATM switching module" will likely follow, said Dave Fowler, Chipcom's vice president of marketing. He indicated Chipcom might be targeting mid-1993 for an ATM backbone interface.

Hub leader Cabletron Systems, Inc. is remaining mum about specific plans, but Bill Clark, product manager of advanced technology, said, "Cabletron has a specific ATM direction," which could be an interface, switching module or full switch. He declined to comment on whether the 631M bit/sec. backplane in Cabletron's Multi Media Access Center will have enough life left in it to support ATM.

Bytex runs a 3G-bit backplane; Adaptive's backplane, which sports a card plug-in architecture that closely resembles that of the gigabit-backplane in the Wellfleet router, has 1.2G bit/sec. of network capacity.

JOANIE M. WEXLER

IN BRIEF

# Maintaining net uptime

■ Forest products supplier **Weyerhaeuser Co.** and **AT&T** said they signed an agreement outlining a formal process for determining whether AT&T, Weyerhaeuser's primary telecommunications carrier, is maintaining service quality expectations. Both firms will provide executive, operations and sales teams to discuss what is needed to maintain network uptime.

■ **Vitalink Communications Corp.** in Fremont, Calif., announced that it has signed a reseller agreement with **Digital Equipment Corp.** that will allow DEC to immediately start to resell Vitalink's 5000 series of TransLAN, TransRing and TransPath bridge and bridge-router products and network management products.

■ **Fibronics International, Inc.** has announced a 50% reduction in the price of its Fiber Distributed Data Interface bridges and routers.

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# DG product releases reaffirm Unix direction

BY KIM S. NASH
CW STAFF

WESTBORO, Mass. — Data General Corp.'s recent introduction of a passel of new products — including high-end and midrange Unix servers — clearly reaffirms that the company's wagon is hitched to Unix.

DG/UX 5.4.2, an upgraded operating system that supports symmetric multiprocessing and HADA II, one of the industry's first high-availability disk arrays geared to Unix environments, temporarily sets DG apart from other Unix players. However, DG and its rivals are apt to hit rocky terrain as Unix boxes become less differentiated and more commodity-like, according to analysts and users.

> "WE MET WITH executives from DG and HP and they . . . recognized that Unix machines are pretty much a commodity already."
>
> DENNIS KOTECKI
> SAINT MARY MEDICAL

For example, the main reason Saint Mary Medical Center opted for DG instead of Hewlett-Packard Co. was the Aviion's superior price/performance, said Dennis Kotecki, director of information systems.

The Long Beach, Calif., medical facility, which previously had not used equipment from either vendor and is making its first foray into Unix, compared an AV 6280 top-end server with a comparably priced HP 9000 Model 887. The AV 6280 rang up 40% better performance, Kotecki said.

"We met with executives from DG and HP, and they . . . recognized that Unix machines are pretty much a commodity already," Kotecki said.

### The RAID advantage

An advantage DG currently enjoys, however, is HADA II, a storage subsystem that uses redundant arrays of inexpensive disks (RAID) technology. HADA II was built on technology used in HADA I, a similar subsystem for the company's proprietary MV Eclipse minicomputer line. But HADA II offers more storage capacity — up to 20G bytes. Also, support for various RAID levels is available, including Levels 0, 1, 3 and 5, according to DG.

At an unveiling two weeks ago, DG executives touted the product, with a base price of $35,000, as "unbeatable."

Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif., disagreed. He explained that although HADA II "is a big thing for now," the advantage will be short-lived. Other vendors will no doubt produce similar wares sooner rather than later, he said.

# Fax solves imaging dilemma

*Virginia Power avoids costly workstation upgrades via coupling plan*

BY ELLIS BOOKER
CW STAFF

RICHMOND, Va. — Like many companies that are evaluating electronic document imaging, Virginia Electric & Power Co. faced a dilemma: how to avoid an expensive upgrade of its communications network and computer terminal infrastructure, yet still provide access to document images for casual users.

Unlike most other companies, however, Virginia Power was under a federal mandate to make enterprisewide access to information a reality.

Under the 1987 Occupational Safety and Health Administration Hazard Standard Notification rule, utilities such as Virginia Power have to provide safety and hazard documents — so-called Material Safety Data (MSD) sheets — to any employee who requests them.

Since 1987, Virginia Power has complied with the rule with a manual, paper-based system. But with 12,600 employees and several thousand of the 1- to 12-page sheets to administer, the paper shuffle had become a major administrative undertaking.

ON SITE

VIRGINIA POWER

**Virginia Power**
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- **Challenge:** To provide access to thousands of health and safety documents to a work force of 12,600 people without incurring massive workstation costs.
- **Technology:** Electronic document imaging.
- **How it works:** Users select documents from an IBM DB2 index on the corporate mainframe, which triggers a fax gateway on the LAN-based imaging system to send the document to one of 260 waiting fax machines.

The push for imaging began two years ago, when the company decided to centralize the management of the safety documents, according to Susan Peterson, client services project manager at Virginia Power's information systems group.

The idea of keying the documents into a central database was rejected, according to Peterson, for fear of the errors this process would inevitably introduce.

"When these documents come to us, we consider them to be in final form, and our intent is not to change them in content or meaning," she said.

Another nonimaging option — electronic data interchange, direct from the vendors — was ruled out because few of Virginia Power's many suppliers have that capability. "It seemed to us the lowest common denominator is paper," Peterson said.

Virginia Power picked an imaging system from ViewStar Corp. in Emeryville, Calif. But a question remained of how to provide imaging access to all employees, many of whom were connected to the utility's 3090-class mainframe.

### Solution found

The answer was to couple the ViewStar system with the mainframe.

According to Bob Borowicz, a consultant at Broughton Systems, Inc. based here, the application works in the following manner:

An operator at the ViewStar workstation is simultaneously connected to the mainframe via a 3270 window. Using the Dynamic Data Exchange feature of Microsoft Corp.'s Windows — the workstation interface for ViewStar — the operator assigns each image an index number from the mainframe-based IBM DB2 database.

Later, casual users needing an MSD sheet merely log on to the mainframe, consult the index of "imaged" documents and request one. The local-area network system, alerted to this event, sends the requested docu-

*Continued on page 64*

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# AI seeks new programming role

*Futuristic technology allows programmers to bind tool kits together*

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — Artificial intelligence, which has long been associated with robots, rules-based reasoning and expert systems, may have found a new niche as the "glue" that holds together a programmer's tool kit.

AI proponents at the recent American Association for Artificial Intelligence (AAAI) conference said many business problems cannot be solved with procedural code alone. You start with a business problem, break it apart into its components and then choose the best technology to process each component, said Bernadette Minton, a case-based reasoning expert at Aion Corp. in Palo Alto, Calif, which recently agreed to merge with AICorp.

Pure case-based reasoning can be strengthened by generalized rules from knowledge-based management systems, Minton said. Case-based reasoning uses stored examples of previous problems and their resolutions to deduce solutions for new problems. Knowledge-based systems contain lists of "rules" from experts in a given subject area. For example, a petroleum engineer who retires from a company can store his knowledge about drilling for oil wells so that other employees can benefit from his experience when he is gone.

Future computer systems will manipulate mixed data types and will require a broader and more flexible tool set. AI can provide a series of reasoning routines that will hold the tools together. "A lot of these AI techniques complement each other well," said Marc Goodman, an AI researcher at Brandeis University in Waltham, Mass.

AI programs can help users to filter and analyze large volumes of data collected by browsing on an enterprisewide network that would otherwise inundate them. A factory-floor AI application can highlight machine outages using multimedia graphics to pinpoint failure "events" passed along from a real-time monitoring system. Expert systems can handle the processing of unstructured data types such as images, multimedia and text.

**Brainchild to boom**

"There's a lot more to come," said AAAI President Pat Hayes, a scientist at the Beckman Institute at the University of Illinois at Urbana-Champaign. "AI is a collection of ideas about how to manipulate information."

As computing hardware becomes more powerful, it will become practical to apply CPU-intensive AI software to everyday problems, Hayes predicted. Until now, there was a mismatch between AI processing requirements and hardware costs. "A lot of AI techniques have not ever been put into commercial products," he said.

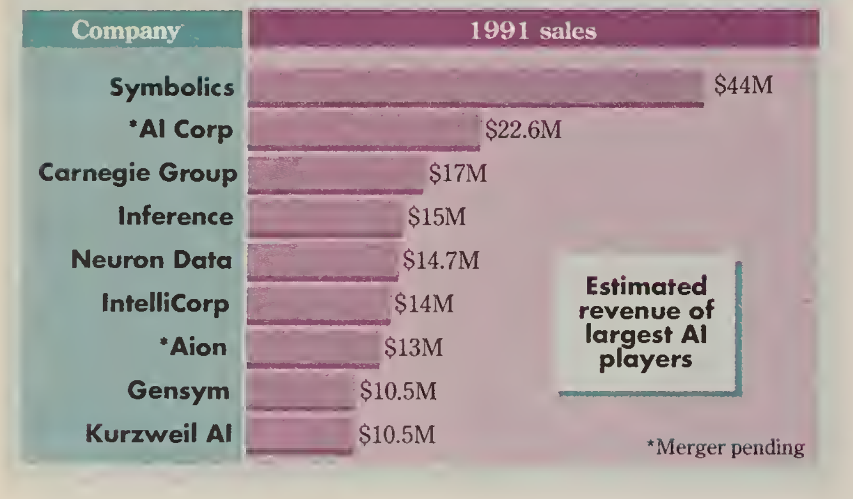
But a lot of integration work must be done to make AI tools — many of which have had limited commercial appeal — part of general-purpose programmer tool sets. Some AI firms have already moved to reposition their products — including Intellicorp in Mountain View, Calif., which is now marketing its Pro-Kappa product line as a set of object-oriented tools.

"Somebody has to come up with an integrated environment where you have bits and pieces of logic mixed," said Natasha Krol, a program director at Meta Group, Inc. in Stamford, Conn.

Several vendors said they are already working on integrated software kits, including AICorp. and IBM. "We have built a set of editors that make it much easier for an end user to maintain a knowledge base," said Jim Gagnard, chief executive officer at AICorp. "Our technology is centered around inference engines, but we have to rebuild it as a tool set." AICorp. plans to mix AI, object-oriented tools and database connectivity tools in a suite of developers' products that will be ready within 18 months, Gagnard added.

**Intelligent life**

*The AI market is dominated by expert systems companies*



Source: The Relayer Group/AI Trends

CW Chart: Stephanie Faucher

## Focus on function

Practical uses of AI were in the spotlight as the AAAI held its fourth Innovative Applications of Artificial Intelligence conference in San Jose, Calif.

Among the systems showcased were one that helps plan Nynex Corp.'s telephone network and one that speeds the handling of user calls to Compaq Computer Corp.'s support hot line.

Compaq's Support Management Automated Reasoning Technology (SMART) system uses case-based reasoning to help customer support technicians save time, said Timothy Acorn, manager of technical support at Compaq's Houston headquarters.

SMART, installed one year ago, is based on a Sybase, Inc. SQL Server database and a Compaq SystemPro 486 with 24M bytes of memory and 1.6G bytes of disk storage. The AI technology for SMART came from Inference Corp. in El Segundo, Calif.

Another system, Spotlight, scans supermarket checkout data for trends in buying patterns. It uses knowledge-based reasoning to analyze gigabytes of data gathered by A. C. Nielsen Co. in Northbrook, Ill. A search that used to require two to four weeks can now be handled in less than 30 minutes with Spotlight, system designers said.

Many of the 19 systems discussed here brought significant savings to their owners. Nynex's Arachne expert system identified $10 million in capital expenditures that could be saved in Nynex's Massachusetts region. Arachne aids designers of the telecommunications firm's network infrastructure.

JEAN S. BOZMAN

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# Unix spells end of line for club's aging minis

BY ELLIS BOOKER
CW STAFF

STREAMWOOD, Ill. — Last year, Awana Clubs International added up the annual maintenance costs and relicense fee for the system software on its two Unisys Corp. mainframes and began exploring Unix alternatives.

As a result, this 42-year-old organization, which operates Christian children's clubs in cooperation with more than 6,000 churches worldwide, will be looking for a buyer for its midrange Unisys A12 and A6 hosts next month.

The move to Sun Microsystems, Inc.'s four-processor 630 "came down to a cost issue," said Tim Rathjen, the project manager of Awana's information systems department.

Sun's line beat out several other Unix server vendors, including Unisys's own U 6000 series. In fact, Unisys — which wants very much to capture these sorts of open systems migrations among its mainframe customers — appears to have lost the Awana bid in part because of the turmoil in its mainframe business.

"Support from them hasn't been great for the mainframe product," Rathjen said.

Rather than port its long-used financial and distribution software to Unix, Awana chose to replace it. The old software, known as the Burroughs Distribution Package (BDP), had been written under a version of Unisys' Link fourth-generation language that is no longer supported.

"To upgrade, it looked like we'd end up doing a major rewrite anyway," Rathjen said.

Awana is replacing the BDP program with SSI Financials and Distribution from Aurora, Ill.-based Software Solutions, Inc. (SSI), which converts the 6G bytes of data from Awana's old hierarchical file structure to an ASCII format for use by the underlying Informix Corp. relational database, Jim Solomon, vice president at SSI, explained.

Awana plans to do all future application development in Informix on a Sun SPARCstation II workstation networked to the multiprocessor Sun 630.

Still, the shift to Unix hasn't meant a wholesale change in all of Awana's systems. For instance, about 30 of 75 users are still using proprietary Unisys BTOS workstations, which have their own server and office automation platform.

"Right now we're using a terminal emulator to get [the BTOS users] through to the Sun 630," Rathjen said. Eventually, however, the organization plans to replace these and run all application from the Sun server.

Apart from avoiding future mainframe fees and costs, Awana has witnessed some upfront savings since starting the move to Unix.

> THE MOVE TO Sun Microsystems, Inc.'s four-processor 630 "came down to a cost issue."
>
> TIM RATHJEN
> AWANA

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# Imaging dilemma

CONTINUED FROM PAGE 63

ment to a personal computer-based fax server, which spits out the image to 1 of 260 fax machines at 60 company locations throughout the state. Users can also instruct the system to send a document to a location outside the company, such as a hospital.

"There are about 7,000 MSD sheets to scan, and two interns are doing this job at about 150 documents per day," Borowicz said. In the future, he said, the scanning step may be avoided by having the suppliers fax their MSD sheets directly into the ViewStar fax server.

Although its current use of imaging is specialized and its investment of about $200,000 is modest, Peterson said she is thinking about the changes a broader use of imaging will require in high-speed networking, storage systems and work-flow application development.

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IDCS 3.0 costs $995 for AS/400 Model 9402 and $1,800 for other manuals.

**Data Summary**
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Information Builders, Inc. has announced SmartMode for Focus, an intelligent query analyzer/governor designed to control Focus requests. Focus is a fourth-generation language for application development and end-user computing.

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**(212) 736-4433**

Systems Center, Inc. has announced NDM-MVS/SQL, a software package that provides an SQL link to IBM DB2 databases.

NDM-MVS/SQL was designed to simplify data transfer for distributed, host-connected applications. According to the company, NDM-MVS/SQL provides users with a tool for transferring data, while ensuring data integrity, availability, reliability and security. Data can be selected from a DB2 database and transferred to a flat file on a variety of operating systems, or it can be transferred to another DB2 database. Any NDM-supported operating system can transfer and insert a flat file into a DB2 database.

Prices range from $5,500 to $21,850.

**Systems Center**
**1800 Alexander Bell Drive**
**Reston, Va. 22091**
**(703) 264-8000**

### Software application packages

Avalon Software, Inc. has a new version of its CIIM client/server manufacturing software for Oracle Corp.'s relational database management system.

CIIM 8.5 is a line of fully integrated manufacturing, distribution and financial software applications.

Enhancements in this release include increased ease of use via support for Oracle SQL Forms 3.0, more financial functionality and support for corporate entities. Multicurrency support, greater flexibility in the systems financial modules and more layers of user and system security have also been added.

Prices range from $25,000 to $750,000.

**Avalon Software**
**3716 E. Columbia**
**Tuscon, Ariz. 85714**
**(602) 790-4214**

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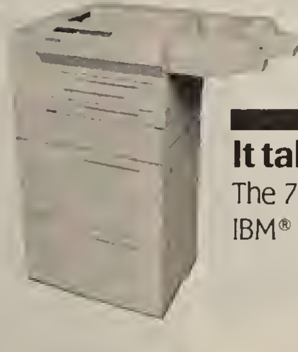

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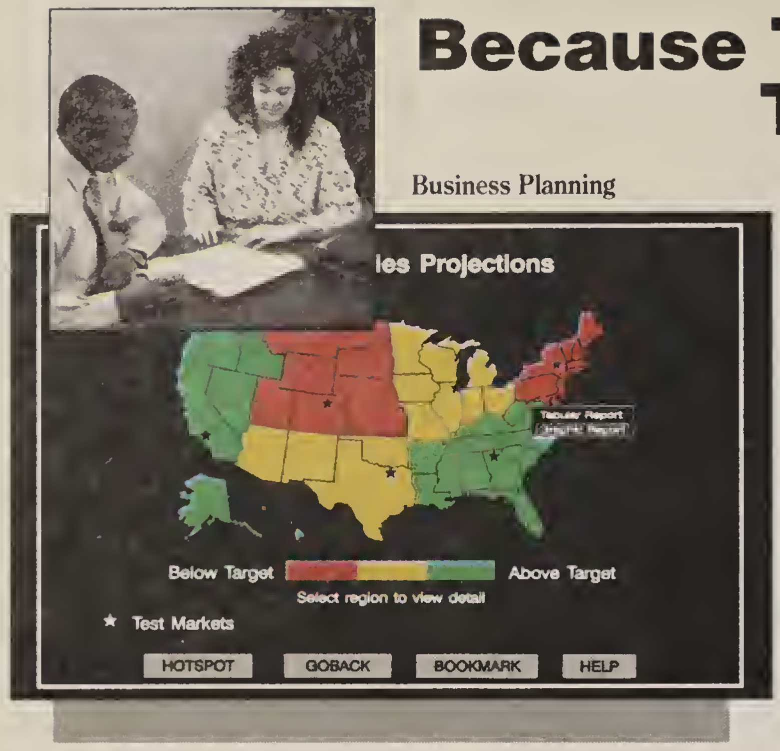
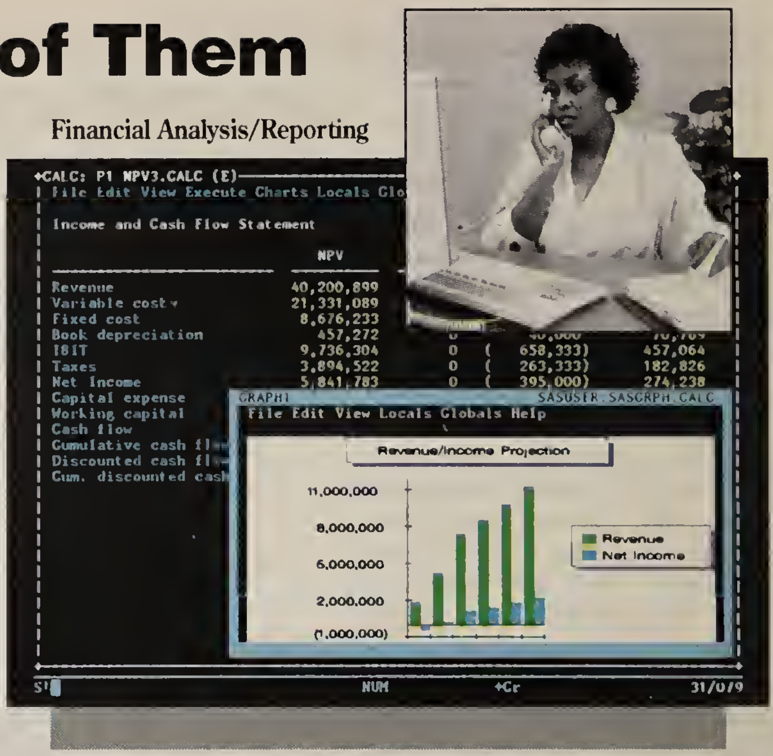


Business Planning



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 Income and Cash Flow Statement

                               NPV
 ______________________     __________
 Revenue                    40,200,899
 Variable cost▾             21,331,089
 Fixed cost                  8,676,233
 Book depreciation             457,272
 EBIT                        9,736,304     0  (   658,333)    457,064
 Taxes                       3,894,522     0  (   263,333)    182,826
 Net Income                  5,841,783     0  (   395,000)    274,238
 Capital expense
 Working capital
 Cash flow
 Cumulative cash fl
 Discounted cash fl
 Cum. discounted cash
```

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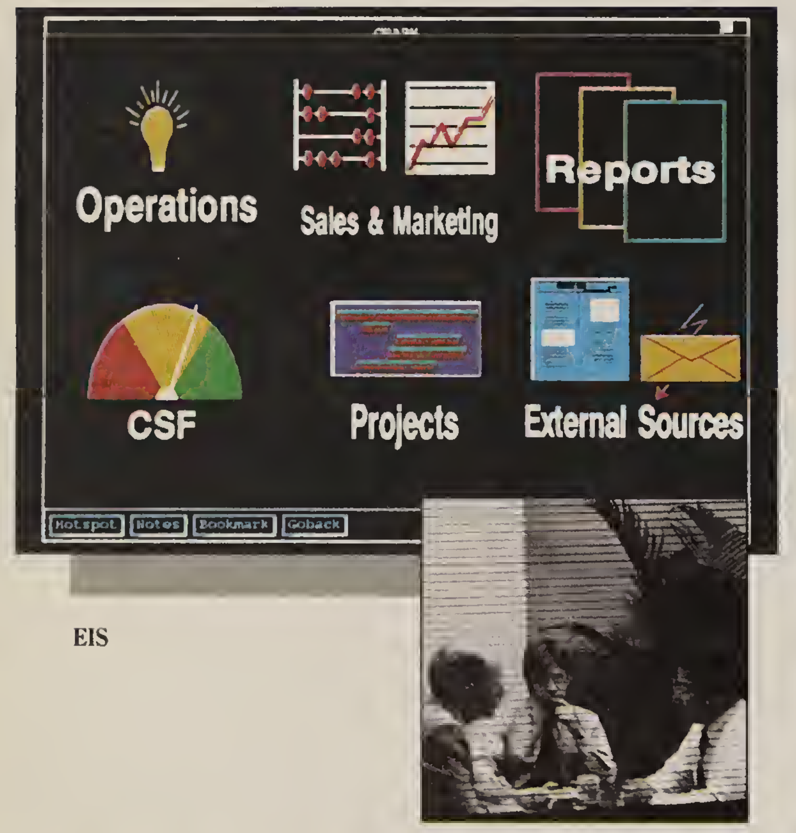

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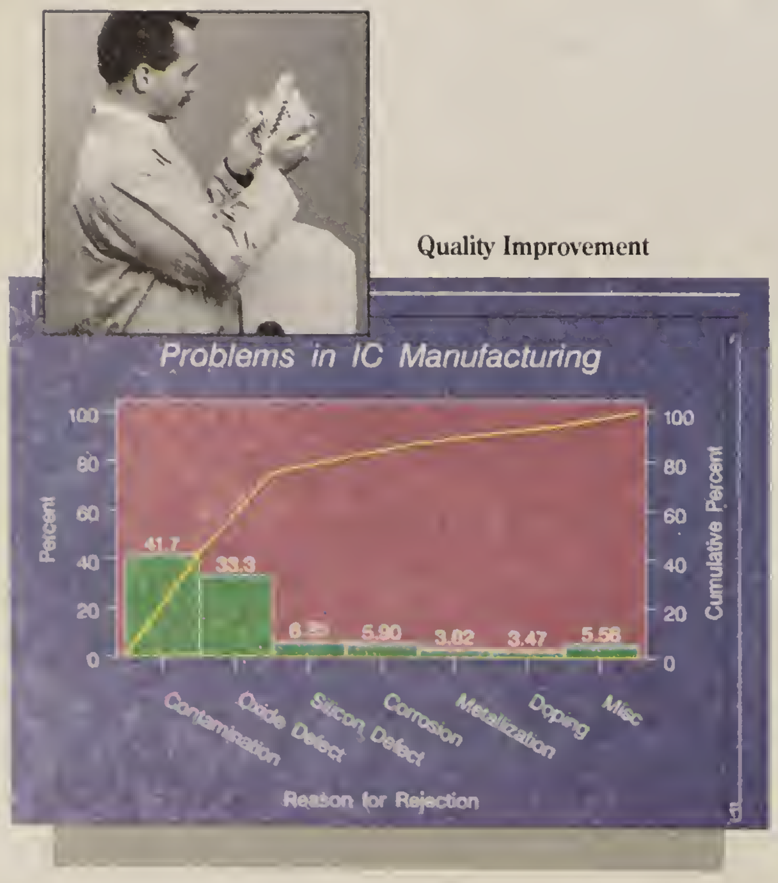
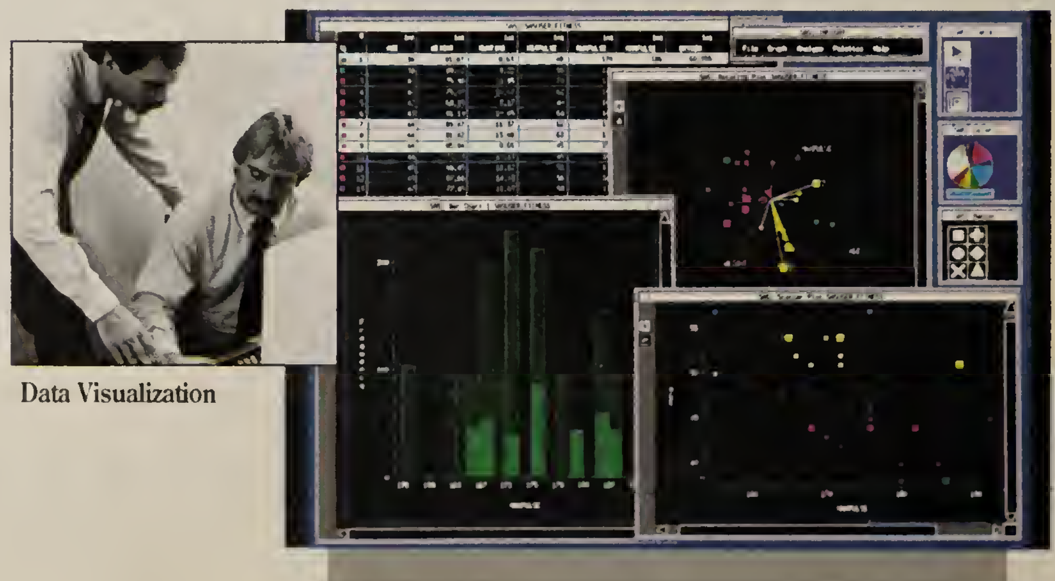


Quality Improvement



Data Visualization

# APPLICATION DEVELOPMENT

CASE • LANGUAGES • TOOLS

COMMENTARY

*Judith S. Hurwitz*

## Process, then programs

It is a time of soul-searching in the applications development arena. Suddenly, the world seems to have discovered that applications are far from perfect. Some pundits are even asserting that we have not made any gains at all in the last two decades.

In part, the pundits are correct. Systems built over the past 20 years are flawed. Some of these flaws are technological and some are failures of communications. Both problems can be fixed.

But before we discuss how to change, let's look at the source of business frustration with today's applications. Many observers wonder why we are not able to design applications processes in the same way that we design manufacturing processes. After all, a process is a process, right?

### Ain't necessarily so

Not necessarily. In factory automation, it is relatively easy to define all of the possible activities involved in the manufacturing process. Details may change over time, but the fundamentals do not.

Not so in applications development.

When we develop systems, we are in fact trying to mimic a vast array of corporate rules and knowledge. Take the developer trying to create an insurance policy system. The system has to reflect business issues, planning and policies — none of which are easy to capture in software.

### Fly in the ointment

What is the problem? Computers are wonderful at repetitive tasks — they always have been. But when it comes to handling more subtle knowledge, they are less adept.

So, what's the solution? Should we simply declare the past 20 or 30 years of commercial systems development a failure and move on? Probably not.

Many of these earlier systems really did accomplish the tasks for which they were intended. They allowed large businesses to process millions of

*Continued on page 68*

## IBM repository shift suits users, for now

BY JOHANNA AMBROSIO
CW STAFF

IBM's decision to de-emphasize its mainframe Repository Manager/MVS in favor of a local-area network version suits some users just fine for right now. But large shops expect they will eventually need the power of a mainframe as well.

That was the response to IBM's plan to shift resources away from its mainframe repository and toward providing application development tools and a repository on the workstation and LAN. IBM has been briefing users and analysts about this scenario, which the company is expected to announce within the next two months [CW, July 20].

"We've been using a LAN repository to start capturing data, but I wonder if it will be robust enough," said Brad Ellis, principal manager of data management at McDonnell Douglas Corp. in Hazelwood, Mo. The company has been using ProKit Workbench from McDonnell Douglas Systems Integration Co. in Maryland Heights, Mo., to implement a manufacturing resource planning application, "and we've been pushing it pretty hard," he said.

"It will be a while before we're ready for a mainframe repository, but I think eventually large users will need a combination of the two," Ellis added.

### Server search

Ira Morrow, a vice president at Shearson Lehman Brothers, Inc. in New York, said that once a truly distributed database is available, users will be able to keep repository data on various machines and then do a server search to find whatever they need. Still, he agreed, "there may be some shops that need or want a centralized repository, and there should be a choice."

Shearson has been using mainframe-based data dictionaries from Manager Software Products, Inc., BrownStone Solutions, Inc. and Reltech Products, Inc. as "interim" solutions.

Morrow said his key criteria for a repository — regardless of hardware platform — are that tools work with it, that it allow for different developers to work on the same project at the same time and share information; and that it provide the ability to keep track of different versions of a project.

All these features were supposed to be part of IBM's mainframe-based Repository Manager, although a full-fledged product was never delivered.

"There's a crying need in the user community for the concepts of Repository Manager as presented in the original vision," said Ed Acly, an analyst at Technology Investment Strategies Corp. "It will be a while before those capabilities come out on the LAN."

Another problem with IBM's plan, he said, is that the LAN and mainframe repositories will use two different models — object-oriented on the former and entity-relationship on the latter. "Although object-oriented tools are clearly needed and wanted, they're not necessarily substitutable for entity-relationship modeling. That's the dilemma IBM is facing," Acly said.

The uncertainty surrounding IBM's mainframe-based Repository Manager is one reason that Du Pont Co. "is sitting back and not doing anything with it" even though it has the repository in-house, said Dick Stromberg, a consultant at the Wilmington, Del., company.

"A lot of the effort here has moved toward implementing applications packages to get the level of integration we're looking for," Stromberg said.

For example, Du Pont has installed a family of manufacturing and accounting applications from SAP America, Inc. in Lester, Pa., that share data. Still, he said, "I would think that large users need an enterprisewide repository."

## Corporate developers hedge on NT

BY GARRY RAY
CW STAFF

While Microsoft Corp.'s promotion of Windows New Technology (NT) has reached a fever pitch, corporate application development managers and other observers remained mixed about their plans to develop for the future operating system.

Microsoft, at its first Win32 Professional Developers Conference held earlier this month in San Francisco, announced that nearly 150 application development tools from nearly 100 vendors already are or soon will be available for the operating system. IBM's OS/2 2.0, which shipped in March, will be supported by nearly 140 third-party development tools at year's end, according to IBM.

However, corporate developers are still waiting for the operating system wars to shake out. A recent survey by the CW Database Division found that information systems managers expect Windows NT to be a key strategic component in many environments but that it would be implemented on only 6% of all personal computers during the next two years.

"Tools are not that important to me," said Theresa Doyle, a vice president for computer and information systems at New York financial firm Dean Witter Reynolds.

The steady stream of support for Windows NT "means that developers are committed," she noted, though her company's equity research department does not develop many in-house applications. Still, Doyle added, "we'll look at NT as soon as it's available."

### Faithful to OS/2

Despite the Windows NT buildup, other corporate IS managers remain firmly committed to IBM's OS/2 operating system, largely because of strategic plans that were in place prior to the breakup of IBM and Microsoft about two years ago. And they seem unwilling to wait for Windows NT announcements and promises to come to fruition.

Of the industry's support for Windows NT tools, Cary Serif, manager of applied technology at Columbus, Ohio-based Huntington Bank, said, "That's nice, but we're more confident with something that exists today." Huntington Bank, he said, made a strategic commitment to OS/2 applications and development tools in 1988. "I'm very uncomfortable with having to build applications based on [Microsoft's] strategy of the week."

A similar position was echoed by the vice president of end-user support at a large Northeastern bank who did not want to be identified. "We're very much an IBM-oriented DP organization, so [the availability of Windows NT development tools] hasn't really changed our position at all."

Windows NT supporters have been attracted to the operating system not so much for its broad array of development tools but for tools that address their specific concerns.

Windows NT is "absolutely critical to us," said Sherm Weinberg, manager of strategic planning and data administration at CF Industries, Inc., a farm cooperative manufacturer in Long Grove, Ill. As planner of the company's database strategy, Weinberg said he found the OS/2 Database Manager inadequate for CF Industries'

*Continued on page 68*

**Choose one or both**

*The majority of today's development tools support both Windows NT and OS/2*

**Development tools: Which platforms they support**

| | Windows NT | OS/2 |
|---|---|---|
| **C compilers** | | |
| Borland C++ | ✓ | ✓ |
| Microsoft C++ | ✓ | |
| Symantec/Zortech C++ | ✓ | ✓ |
| **Cobol compilers** | | |
| Micro Focus Cobol | ✓ | ✓ |
| **Programming tools** | | |
| Mansfield Software Group Kedit | ✓ | ✓ |
| Microquill Performance Tracer | ✓ | |
| Intersolv PVCS Version Manager | ✓ | ✓ |
| Microedge Slickedit | ✓ | ✓ |
| **SQL servers & tools** | | |
| Gupta SQL Windows | ✓ | |
| Sybase SQL Server | ✓ | ✓ |
| XDB Systems XDB Server | ✓ | ✓ |
| Microsoft SQL Server | ✓ | ✓ |
| Oracle Server | ✓ | ✓ |
| **CASE/GUI tools** | | |
| Popkin Software System Architect | ✓ | |
| Andersen Consulting Foundation | ✓ | ✓ |
| Caseworks Workbench | ✓ | ✓ |
| Neuron Data Open Interface | ✓ | ✓ |
| XVT Software XVT | ✓ | ✓ |
| **Client/server tools** | | |
| Mozart Systems Mozart | ✓ | ✓ |
| Easel's Easel Workbench | ✓ | ✓ |

# Hurwitz

CONTINUED FROM PAGE 67

invoices, claims and statements. They allowed them to track customers. However, developers of these systems didn't anticipate change.

The demand for faster, more responsive systems comes at a time when users are learning more about the power and capabilities of computers. They expect new technology to be more accessible and easier to use.

Application developers have a responsibility both to provide realistic expectations and to make sure that users can gain the most benefit from today's imperfect systems. This requires highly developed communications skills and a willingness to begin slowly dismantling systems that must be changed and rapidly introducing new technologies that encourage experimentation.

> THE REAL CHALLENGE is based on human communications and relationship building — a trait often found lacking in IS management circles.

It means that it is time for IS management to take on two challenges. First, IS management has to begin to carry on two-way conversations with senior line management, not just middle management. Those conversations must be aimed at capturing and codifying business rules and procedures, no matter how subtle. Even better, line managers can become partners in helping IS to develop better applications that the business really needs.

Second, IS management has a responsibility to its business to ensure that these systems are designed to withstand the test of time. "Things will change" should be its clarion call.

In both cases, the challenge has nothing to do with tools or technology because neither will solve the underlying problem of today's application development. Rather, the real challenge is based on human communications and relationship building — a trait often found lacking in IS management circles.

To succeed, IS management will have to take on a new attitude predicated on relationships and pointed at change.

---

Hurwitz is president of Hurwitz Consulting Group, a Newton, Mass., consultancy specializing in applications development trends and technology, and publisher of "Tool Watch: Enabling Open Applications Development."

# Silicon Graphics adds to CASEVision family

BY KIM S. NASH
CW STAFF

MOUNTAIN VIEW, Calif. — This summer has been busy for Silicon Graphics, Inc. Two weeks after rolling out new Unix workstations in its Iris Indigo line, the $550 million company introduced CASE tools last week, expanding its 1-year-old CASEVision line.

The computer-aided software engineering (CASE) products are graphical tools aimed at building applications in both commercial and technical Unix shops.

The CASEVision family supports ToolTalk, an object-oriented framework from Sun Microsystems, Inc. that lets different vendors' tools talk to one another and exchange information. ToolTalk battles Hewlett-Packard Co.'s SoftBench framework.

## Sprucing up image

Known primarily for hardware based on reduced instruction set computing (RISC) technology, Silicon Graphics is trying to step up its software presence, according to a spokesman. The new wares are part of an overall push to promote the company's Visual Magic Division, which was formed last year when management rolled its software groups together. Currently, "a lot of people don't even realize we have a software division," the spokesman said.

That is true of many traditionally systems-only vendors that are elbowing into the software sector to bolster sagging revenue as hardware becomes increasingly margin-thin, according to Susan McGary, an analyst at The Yankee Group in Boston. "Yet the hope for systems vendors," she said, "is really software and services."

New products under the CASEVision banner include the following:

- CASEVision/ClearCASE, a version control tracker developed by Atria Software, Inc. The Natick, Mass.-based company signed reseller agreements in May that let both Silicon Graphics and HP market ClearCASE. The $3,000 product was designed to support parallel development — i.e., programmers working in a Unix local-area network environment.
- CASEVision/Tracker, a bug monitor priced at $1,600. Tracker traces bugs in programs that developers are working on and shows where the bugs originated and how they affect other parts of the application.

Tracker and ClearCASE are also available as a package for $3,750.

- Iris Indigo DevStation, a RISC-based personal computer with 16M bytes of random-access memory and a 432M-byte disk drive for a base price of $11,995. The machine, which is slated to be available in September, comes configured with libraries and tools that include a C compiler and OSF/Motif utilities.

A service called CASEVision Consulting is also available to help users integrate CASE into their shops and train programmers, among other tasks.

# Corporate developers hedge on NT

CONTINUED FROM PAGE 67

needs. "When we looked at [Microsoft's] SQL Server vs. IBM's Database Manager, SQL Server was head-over-heels better," he said. Microsoft was demonstrating a Windows NT version of SQL Server at the recent developer's conference.

Weinberg also said the array of development tools for SQL Server and for Windows NT will ultimately be more complete than for OS/2. "The tools are not complete yet, but we see the market going to Microsoft," he said.

Some observers said they expect Windows NT will initially take a large chunk of its market from Unix installations.

Peter Schleider, an investment analyst at Minneapolis financial firm Wessels, Arnold & Henderson, predicted that "of the application development group that's Unix-based today, almost 75% will be going to NT in the next year."

## Slow to go

According to Schleider, corporate OS/2 developers are less apt to move to Windows NT in such a short time frame. Windows NT "will initially be used [to develop] technical applications," which is the traditional focus of Unix development efforts, Schleider said.

Agreeing with that assessment was Eddie Currie, president of Port Washington, N.Y.-based Imagesoft, Inc., a seller of C++ development tools. The interest in Windows NT "doesn't speak well for Unix in general," he said.

Currie also noted a single important reason why vendors will port their tools to Windows NT: the marketing strength of Microsoft.

According to Currie, "Microsoft will continue to dictate the way things go and to have success with NT and other things they do."

Imagesoft, he said, has begun porting all of its 50 development tools to Windows NT.

# NEW PRODUCTS

## Computer-aided software engineering

Telesoft has introduced the ASIS Toolkit, a technology that enables users to integrate their tools to the Ada library system.

Ada Semantic Interface Specification (ASIS) was designed to develop Ada-knowledgeable, portable computer-aided software engineering (CASE) tools to boost user productivity.

Reverse-engineering tools, semantic editors, automatic test generators and configuration management systems are some applications included in the CASE software.

Prices for a single ASIS Toolkit range from $13,500 to $36,000, depending on the hardware configuration.

**Telesoft**
**5959 Cornerstone Court W.**
**San Diego, Calif. 92121**
**(619) 457-2700**

## Application development tools

Liant Software Corp. has released C++/Views 2.0 class library.

Users can develop portable applications for Microsoft Corp. Windows, OS/2 Presentation Manager and Unix/Motif. C++/Views 2.0 consists of a third-generation, object-oriented development framework combined with more than 100 ready-to-use classes and programmer productivity tools.

A re-engineered Notifier class provides users with control of resource-based dialogs and support for multiple document interface; a C++/Browse source-code development tool automates programming tasks.

C++/Views for Microsoft Windows costs $495, $995 for OS/2 Presentation Manager and $1,495 for Unix/Motif.

**Liant Software**
**959 Concord St.**
**Framingham, Mass. 01701**
**(508) 872-8700**

Software Maintenance & Development Systems, Inc. has introduced the ADC/AdaScan.

ADC/AdaScan is an option to Aide-De-Camp, an object-oriented software configuration management system.

The product was designed to help the Ada user find which source files belong to a specific program and also tell what major program structures these files contain and what order files should be compiled in to make an executable program. ADC/AdaScan allows users to identify the types of Ada program units a compilation order represents.

The ADC/AdaScan costs $2,195 for all platforms.

**Software Maintenance &**
**Development Systems**
**Suite 300**
**200 Baker Ave.**
**Concord, Mass. 01742**
**(508) 369-7398**

# Noblenet utility eases Unix woes

BY GARRY RAY
CW STAFF

Unix shops will be released from the terrors of remote procedure call (RPC) coding with a new utility announced by Noblenet, Inc. in Natick, Mass., last week.

RPC is an Open Network Computing specification that enables client/server computing by allowing applications residing on one network node to access procedures that reside on other nodes.

For example, an RPC client application could call and use computationally intensive procedures residing on an RPC-enabled, high-speed supercomputer.

Noblenet's tool, EZ-RPC, is a C programming code generator that replaces and enhances the functionality of the Unix System V, Release 4 utility called RPCgen, which is currently included with most versions of the operating system.

According to Noblenet officials, developers first describe the subroutines to be distributed across a network using conventional C language notation. EZ-RPC then generates the additional C language code needed to create the requisite RPC transport and distribution mechanisms.

The C language source code, which Nobelnet officials said is platform-independent, can be examined and altered if necessary.

The tool kit, which is available immediately, is priced at $10,000 per installation with three seats.

# Amazing computing discovery: 3.1 is less than 2.0.

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Of course, you could still go and spend $149.95 for a special DOS and Windows package. But when you consider that for as low as $49 you could get the capabilities of DOS and Windows, plus all the added benefits of OS/2—including Adobe Type Manager™—it just doesn't add up.

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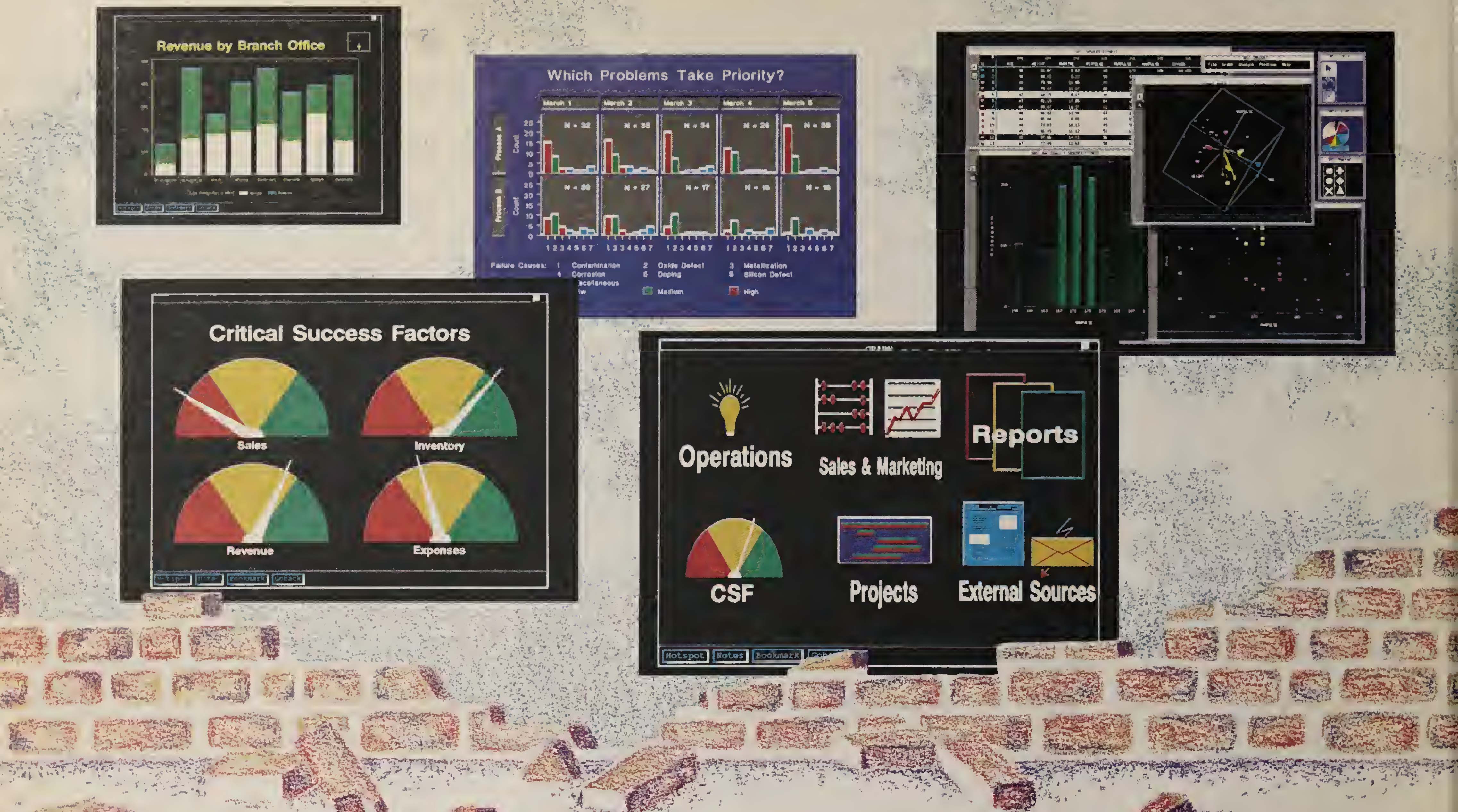
OS/2

| | OS/2: Win-OS/2 Full Screen | DOS 5.0 & Win 3.1 Full Screen |
|---|---|---|
| WordPerfect® (spellcheck)† | 38.5 sec | 43.6 sec |
| AmiPro™ 2.0 (print)†† | 95.1 sec | 104.6 sec |
| Preemptive multi-tasking of Win apps | YES | NO |
| Crash protection | YES | NO |

IBM®

*Upgrade from Windows, $49, upgrade from any DOS, $99, $139 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 7/31/92. Shipping and handling not included. **In Canada, call 1 800 465-7999. Tests conducted by NSTL. System under test is a PS/2 57SX w/4MB RAM and an 8513 VGA display. Under Windows 3.1, applications were loaded and/or executed from the Windows 3.1 Program Manager. Under OS/2, applications were also loaded and/or executed from the Win-OS/2 Full Screen Program Manager. Both Windows 3.1 and Win-OS/2 use a disk cache of 64KB. †Word processor spellcheck. The time required to spellcheck a document with no spelling errors. Open the Word Perfect for Windows 5.1 document entitled "macro.doc." Select TOOLS from the menu bar, then select SPELLER. Select OPTIONS from the SPELLER menu bar, and deselect all of the options. Click OK. Test was timed from the click until the user regained control of the application. "Macro.doc" contains 21 pages and is 47,455 bytes. ††Word Processor Print. The time it took to print a word processing document. Open the AmiPro 2.0 document entitled "printest.sam." Select FILE from the menu bar, then select PRINT. Select FROM page 1 to 1 and click OK. The test was timed from the click until the first page completed printing on the printer. Windows 3.1 used the IBM LaserPrinter 4029 PS17 PostScript printer driver shipped with the Windows 3.1 software package, and Win-OS/2 used the IBM 4029 v2.1 (17 font) PostScript printer driver shipped with the OS/2 2.0 Operating System using LPT1.OS2. NSTL makes no warranties, express or implied, as to results to be obtained by any person or entity from use of the services or the results thereof, or any information or data included therein. NSTL makes no express or implied warranties of merchantability or fitness for a particular purpose or use with respect to the services and/or results thereof, or any information or data included therein. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1992 IBM Corp.



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# Group(ware) therapy

*It takes more than unwrapping the package to create a happy workgroup. People problems loom large. Here's a realistic look at how to stay sane.*

Bob Sacha

**'It's not** *a technical challenge,' Young & Rubicam's Maynard says. 'It's a cultural and organizational challenge'*

BY ALICE LAPLANTE

Corporate hierarchies flatten overnight. Worker productivity triples. Quality skyrockets. Employees work together in peace and harmony as geographic and organizational barriers collapse.

In your dreams.

There's seemingly no end to the utopian scenarios surrounding workgroup computing, the industry's current software darling. Despite the huge potential, experts and early pioneers say that making workgroups work is a tall order for any information systems department or company.

"The implications go way beyond IS," says Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc. The advertising agency has been experimenting with Lotus Development Corp.'s Notes for almost a year in its New York, San Francisco and London offices. "It's not a technical challenge," Maynard says. "It's a cultural and organizational challenge."

Much of that challenge stems from the many-horned nature of the beast.

"Every day we feel like we've had something new to address," says David Payne, a systems analyst who helped start a Lotus Notes pilot at The Provident Life & Accident Insurance Co. in Chattanooga, Tenn. "Who's going to provide the tool? How do we handle chargebacks? Who controls the database?" (See Payne's firsthand account, page 74.)

Though definitions differ, "workgroup computing" usually refers to everything involved when a group of people use computers to collaborate toward a common goal. Success involves many complex organizational factors that go far beyond choosing the best software to buy.

In fact, even the seemingly simple decision of which product to pick is daunting: Groupware is a broad category that covers everything from sophisticated electronic-mail packages to entire office automation suites. Group authoring, calendaring and scheduling, conferencing, information sharing, project tracking and work-flow management are also popular groupware applications.

Despite this fuzziness, businesses are buying in. After a slow start several years ago, sales of groupware are growing rapidly. According to Work-Group Technologies, Inc. in Hampton, N.H., the worldwide groupware sales are expected to reach $2 billion by the end of 1993, quadrupling 1989 sales.

The market is young, ill-defined and highly fragmented. No vendor holds more than an 18% share, says International Data Corp., a research firm in Framingham, Mass. Sales are dominated by Lotus, which says Notes will be installed on 400,000 personal computers by the end of this year.

More vendors are jumping in every month, however. Major announcements are expected from Borland International, Inc. and Microsoft Corp. within six months (see page 74).

### Keep feet on the ground

Though the payoffs of workgroup computing sound attractive, consultants and IS managers stress that too many are plunging ahead with unreal expectations — and false ideas of success.

As in nearly everything, linking technology and business goals, they say, is key.

"Workgroup technologies are only successful if you understand how they will improve your business process," says George Goldsmith, president of The Human Interface Group, Inc., a Wethers-

*Continued on page 72*

**Workgroups**

**KEY POINTS**

- ▶Groupware pioneers say clear business goals, a handpicked group, reviews of existing processes, good training and measurable goals are the keys to workgroup success. See page 73.
- ▶A good demo and soup-to-nuts support are needed to launch a groupware pilot. Firsthand account begins on page 74.
- ▶User stories: Young & Rubicam, Inc. The Provident Life & Accident Insurance Co., Chase Manhattan Bank NA, Dow Chemical Co., Metropolitan Life Insurance Co., Liberty Mutual Insurance Co.
- ▶Industry watcher David Marshak says major software vendors such as Lotus, Borland and Microsoft are expected to continue their domination of the highly scattered market. See page 74.
- ▶FAST FACT: The annual cost to install and maintain a LAN-based E-mail box: About $319 on a 1,000-user site, according to Ferris Networks.

QUOTABLE:

*"The implications go way beyond IS."*

*Howard Maynard*
*Young & Rubicam*

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LaPlante is a free-lance writer based in Palo Alto, Calif.

# Group(ware) therapy

CONTINUED FROM PAGE 71

## Nightmare on Group Street

*To make workgroups pay off, experts say IS managers need to beware of several common difficulties that can haunt efforts*

Bigger LANs and WANs needed
Too many on-line meetings
Blah
Blah
Blah
Chatterboxes
Information and E-mail overload
Harried IS manager
Whatta jerk! How dare he!
Fun & Games
Social loafing
Information misers (a.k.a. clams)
Misunderstood communications

CW Chart: Michael Siggins

field, Conn.-based consulting firm specializing in practice improvement and workgroup computing.

Goldsmith and other experienced hands are quick to debunk the following popular assumptions about workgroup computing:

- **MYTH: The more information users have access to, the better.**

IS managers and consultants agree that too much emphasis is placed on sharing information and not enough on actually completing group work.

"That's perhaps the first 25% of what workgroup computing can do for you," Goldsmith says. "But I don't know of many organizations — unless it's market research or perhaps R&D groups — that are paid for merely sharing information. Most organizations are paid for getting things done, finishing projects on time and on budget and for delighting customers who want to come back for more."

Early implementors simply threw buckets of data at users and hoped greater productivity would follow, notes Bruce D. Sanders, an executive consultant and consulting psychologist who is president of Workgroup Associates in Vacaville, Calif.

"In fact," he says, "the reverse was true. It became easy for the trivial to flood out the significant."

Ironically, a prime example is the Notes User Group, says Michael Mandelbaum, vice president of systems development at the North American Section of Chase Manhattan Bank NA, a workgroup pioneer that now has 1,500 Notes users. The user organization runs a Notes-based database application for 200 corporations worldwide.

The original idea was classic groupware. The premise, Mandelbaum explains, was to give early Notes users a forum to share experiences and solutions.

But things got out of hand, Mandelbaum says. "It used to be that you would see 10 new items posted a day, and it was fairly easy to keep up with what was going on. Now there are 50 or 60 new items, and if you miss two or three days of logging on and reading the database, you become lost."

Learning from the experience, after its initial pilot, Chase appointed expert editors to help keep users from getting bogged down in useless data. Editors hunt out and delete insignificant, inaccurate or misleading entries.

"We found that having a Notes administrator was critical," Mandelbaum says.

- **MYTH: An improved or simplified group process will yield a tangible business advantage.**

Another common and big mistake experts warn against is believing that an improved group process will automatically help the business — or worse, that it's a worthy end in itself.

At Metropolitan Life Insurance Co., some 150 users in the investment department use Notes. In addition, a group-scheduling application, which runs on the IBM Professional Office System (Profs) E-mail system, helps arrange meetings and conferences among team members scattered in New York, Chicago and Atlanta.

According to David Daniels, manager of executive information at the investment department, meetings or videoconferences that once took hours to arrange now take 30 seconds.

But easier isn't always better, he says. "Now people are saying it's so easy to schedule meetings that people are finding it too easy to schedule unnecessary meetings. That wasn't exactly the point of the system."

Goldsmith recounts the tale of a large multinational insurance client that was having a tough time managing a critical project.

After a series of missed deadlines, the team instituted a practice of filing biweekly progress reports. These reports were filed electronically into a database that was reviewed by management and updated every two weeks.

"Unfortunately, people were making their status reports in the form of diary entries, merely listing their activities," Goldsmith recalls. No attempt was made to compare entries with project goals.

"No one had any idea whether the project was on track or not," he says. His solution was to design a Notes application that required biweekly status reports to be matched to specific project goals as soon as a task was completed.

- **MYTH: On-line meetings can replace traditional meetings.**

Groupware veterans say another mistake is assuming that a new way of communicating is better simply because it's new. Instead, they say it's important to know when traditional ways are still best.

"We've found that the types of meetings that can effectively take place electronically are limited," says Neil Drake, a process specialist at Dow Chemical Co. in Midland, Mich. Dow uses several groupware packages for on-line meetings and collaboration.

The company has discovered that it's impossible to hold successful electronic meetings on certain topics, Drake says.

"We do a lot of planning and technical work, so in most of our meetings, body language is only a minor part of most of the communication that goes on," he explains. For those types of meetings, the electronic format is fine.

However, when negotiations or emotions are important — such as when discussions of corporate philosophy or departmental politics or organizational changes are taking place — electronic sessions don't work as well as traditional, face-to-face meetings, he says.

"Bored or annoyed expressions, crossed legs, sitting-back-in-the-chair motions and other body language clues become extremely important to correctly interpreting what is going on," Drake says.

TECHNICAL BACKGROUNDER

## What is groupware, anyway?

*Groupware — software designed to facilitate workgroup computing — is a fuzzy term that covers a broad range of products that fall into a number of different categories:*

- **Information sharing** products are designed to help workgroup members trade data through sophisticated messaging and database functions. Products such as Notes from Lotus Development Corp., Topic from Verity, Inc. and Cooperation from NCR Corp. fall into this category.
- **Electronic meeting** or conference applications — such as Aspects from Group Technologies, Inc., Instant Update from On Technology, Inc. and VisionQuest from Collaborative Technology Corp. — allow two or more users to engage in simultaneous electronic communication via desktop PCs. Many "meetingware" vendors tout their products' ability to provide instant documentation, which lets attendees walk away with hard copies of everything discussed.
- **Scheduling products** — such as Network Scheduler II from Powercore and Action Plus from Action Plus Software — make it easier to arrange meetings or coordinate conferences among a group of people.
- **Networked office automation software suites** such as WordPerfect Office from WordPerfect Corp. and NewWave Office from Hewlett-Packard Co. let individuals perform a variety of applications in sync with one another.
- **E-mail packages** with layers of extra functionality, project management and task management features built-in — such as Higgins from Enable Software, Inc. — are also categorized as groupware.

For this reason, many organizations experimenting with electronic meetings are finding that supplementary means of interaction are important.

For example, if an electronic meeting is going on in one room, participants can interject verbal comments simply by calling them out. At Dow, electronic conferees in different locations will often also use a conference call.

(On the bright side, some conflicts that would arise in face-to-face meetings can disappear in electronic forums.)

- **MYTH: More group participation automatically improves quality and productivity.**

In fact, experts warn that groupware can actually *harm* productivity. Sanders points to several classic research studies of group efforts that identified a phenomenon called "social loafing."

In one study, for example, individuals playing a game of tug-of-war tended to pull less forcefully as teammates were added. "Part of that can be attributed to the difficulty of coordinating your efforts with others," Sanders says. "But another part clearly comes from individual people feeling that their efforts will not be fully recognized."

To avoid this, Sanders advises designing systems in which everyone's responsibility is clear. "Even in the most democratic workgroup, there has to be clear accountability, responsibility and authority," he says.

On a larger scale, Sanders says he fears that companies with severe communication or management problems will see workgroup computing as a way to solve problems that in reality go much deeper than a software package.

"Groupware is not a panacea for solving organizational problems such as poor communication or information overload," he warns.

- **MYTH. People are eager to give and receive new information.**

Remember that kid at school who wouldn't share his crayons? Well now he's working next to you, and he hasn't changed. Experts warn that "information misers" — individuals who won't share information even when it would benefit the organization — can be a big fly in the groupware ointment.

A sales representative, for instance, might hesitate to share leads in a common database for fear of losing a personal advantage. The problem is especially bad in corporations that encourage competitiveness among colleagues.

"There's always the issue of deciding what information people want to share and what information they want to keep private," Mandelbaum says.

Chase tries to promote good information citizenship, he says. The bank's international project finance department shares data between the U.S. and the UK about possible client contracts — a virtual impossiblity in the past.

"Two groups in different geographic and time zones now have full access to everything that is going on in either site," Mandelbaum says.

Even where the corporate climate is favorable, he says, local problems can doom groupware projects. Mandelbaum says Notes projects have failed at Chase because of interpersonal or cultural roadblocks. "We've hit places where we've got a good idea and a good project, but the culture just isn't right for it yet."

- **MYTH: Installing groupware technology is a snap.**

Even though "soft" issues are the biggest groupware concerns, that doesn't mean technical concerns do not exist.

For starters, few organizations have all the necessary network infrastructure in place to make workgroups work.

Functional workgroups can spread beyond the confines of a particular department or geographic site, so companies must first install enough local- and wide-area networks to handle each member.

And because most groupware packages are based on some form of messaging system, installing them on top of the existing enterprisewide E-mail system and other communications packages can make life hellish for both IS and end users.

That was the case at Boston-based Liberty Mutual Insurance Co., project manager Scott Joy says. "One guy in our department needs to check Microsoft Mail, VAX Notes, CompuServe, MCI Mail," Joy says. "The list goes on and on."

Although gateways exist, the simple act of coordinating directories and user identifications is a huge chore. "People are getting bombarded with E-mail boxes," he says.

- **MYTH: IS can lead the charge alone.**

Consultants worry that eager technology professionals are racing untrained into tricky areas that have vexed senior business consultants, behavioral psychologists and organizational change experts for years.

Met Life's Daniels is concerned that IS professionals lack the needed skills to be on front lines of company change.

"There's the old saying that people went into computers in order to get away from people," Daniels jokes. "Now they are finding themselves at the very center of enabling technologies in the corporate culture. It's ironic."

It's no surprise that smarter companies are increasingly turning end users loose on groupware.

Unlike many other pioneers, Maynard says, Young & Rubicam invited business units to create applications. Today, advertising teams in New York and San Francisco devise prototype Notes applications for client accounting, personnel and more. The applications are then taken to IS to develop for worldwide use.

"The potential impact to our company is enormous," Maynard says. "Too enormous to be solely an IS responsibility." •

▶**The Groupware '92 Conference & Exhibition** *runs Aug. 2-5 at the San Jose, Calif., Convention Center. Co-sponsored by SRI International and Lotus, the event features tracks on management, products, technology and user experiences plus a day of technical tutorials.*

*Industry notables such as Jim Manzi, Esther Dyson, Ray Norda, Thomas Malone and Philippe Kahn will host sessions. Exhibitors include several dozen groupware product vendors. For more information, call (800) 925-4906.*

ADVICE

## Here's a little help to make your group click

Experts and early workgroup computing implementors offer tips on what makes workgroup computing successful:

- **Define a specific business objective.** Reject vague desires such as "enhanced communication" or "more team participation" in favor of concrete goals. Examples: higher sales among cross-functional product lines, reduced costs and turnaround time for creating customer presentations or more closings on client deals, says George Goldsmith, president of The Human Interface Group, Inc.

- **Select the workgroup carefully.** Too often, workgroups are created because they already exist (an accounting department, for example), along with a technical infrastructure. Be open-minded enough to create workgroups that transcend existing boundaries or notions, experts advise.

"Groups can be permanent or temporary," says Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "It's a much more fluid concept than a lot of people realize."

- **Appoint workgroup "editors."** To help prevent its 1,500-user groupware from getting bogged down in too much data, Chase Manhattan Bank NA appointed special editors to pare down extraneous or incorrect entries. "We found that having a Notes administrator was critical," says Michael Mandelbaum, vice president of systems development.

- **Examine existing group processes.** Experts say the biggest gains in workgroup computing generally come from improved, re-engineered business functions — not from speeding up existing methods. To this end, it's critical to involve end users, information systems professionals, organizational change experts and business managers at this stage.

It's also wise to look for possible trouble. "By spotting problems in current systems, you can anticipate the ones you'll encounter with workgroup computing," says Bruce D. Sanders, an executive consultant at Workgroup Associates.

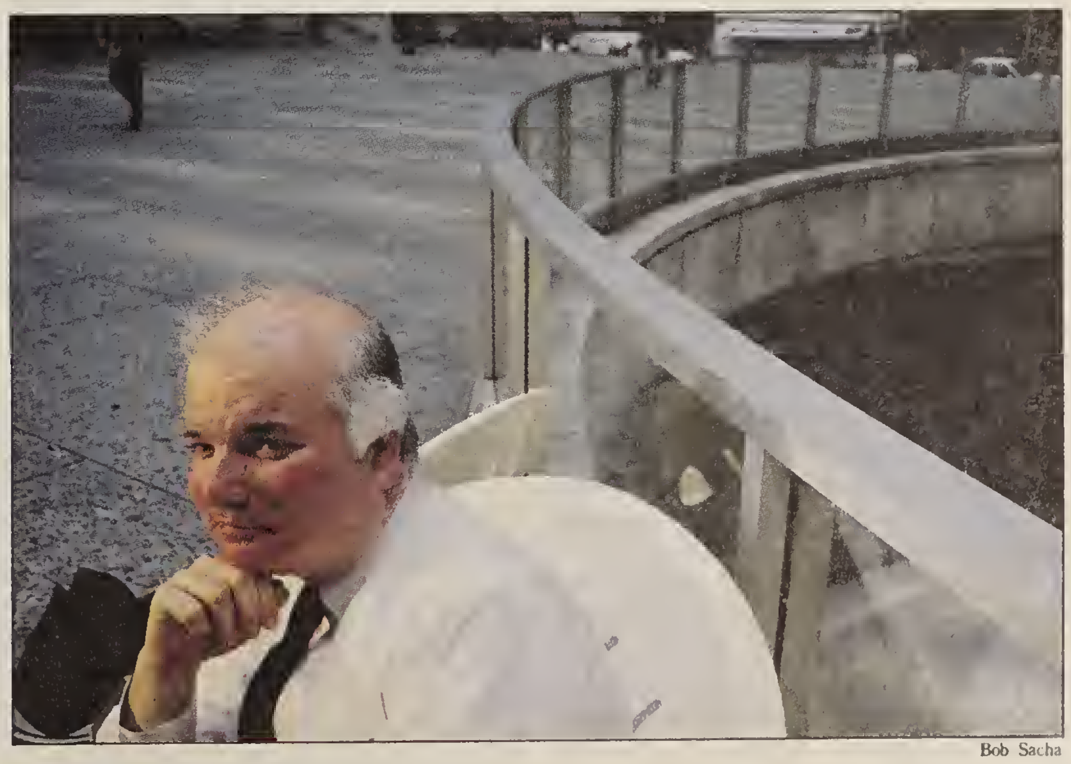
- **Don't forget training.** Companies also need to design and deliver a carefully thought-out program that focuses on much more than mere eye/hand coordination and which key to press. Of special importance is educating users on "electronic etiquette," such as typing (grin) before a lighthearted remark.

- **Make groupware an orientation tool.** Some corporations, such as Dow Chemical Co. and Trellis Network Services in Princeton, N.J., use workgroup packages to quickly orient new hires. "We've built a historical database of department activities over the last five years," explains Neil Drake, a process specialist at Dow. New employees can access a database to read productivity reports, job status entries and programs. Supporters say the tactic helps bring new workers up to speed quickly without diverting other employees from their jobs.

- **Know when to go off-line.** Wally Baker, assistant vice president of corporate planning at Metropolitan Life Insurance Co., says it's important to know when to switch from electronic discussion to in-person talks. "If you're not careful, you can bite off more than you can chew," he says. "We've learned how much time to devote to input and how much time to devote to discussing the output."

- **Establish success measures — and check often.** Quantitative benchmarks for measuring workgroup success are key. This means establishing a baseline standard and having a clear "before" snapshot prior to workgroup formation. During the project, measure often. Ask users and others involved to submit qualitative evaluations of the application's success.

ALICE LAPLANTE



Bob Sacha

**Select workgroup** *'editors' to keep information roads manageable, Chase Manhattan's Mandelbaum advises*

# Two views: Groupware in the firm and marketplace

**FIRST PERSON**

## *An IS missionary discovers that potential users need show AND tell*

BY DAVID PAYNE

Though I'd read about Lotus' Notes over the past couple of years, I didn't fully understand what it was or the significance of groupware until I saw a demonstration at Comdex/Fall '91.

Soon after, we made plans to explore the product. In December 1991, we did our initial installation, which consisted of one Notes server, an IBM Personal System/2 Model 95 and three end users on our team.

My group, part of the information resources department, has built the corporate LAN environment at The Provident Life & Accident Insurance Co. in Chattanooga, Tenn. I joined in January 1989.

From the beginning, our focus has been on the workgroup. We've sought to push beyond "personal productivity tools" and the use of LANs for simple file and printer sharing that characterized the 1980s. To that end, we handle cabling, hardware and software requirements and LAN administration issues to support workgroups. The environment includes everything from a word-processing cluster for a department, an actuarial or underwriting unit, the entire department or a team of managers from different departments.

We have numerous departmental LANs attached to a Token Ring backbone, with more than 800 OS/2-based IBM PS/2 workstations — and the number is still growing.

So with all this preparation, why did installing groupware come as such a surprise? And how did I end up with so much work ahead of me?

### Simple idea, tough sell

Right away, we knew that Notes was very different from any personal computer program we had ever seen. "This is the product that will take us that next step — nay, leap — forward toward workgroup productivity," we said. "Let's start telling everyone the good news."

Easier said than done.

When we asked, "Have you heard of Lotus' Notes?" people in our own department unanimously replied, "Yes, I've read about it. It's an E-mail package, right?"

This broad misconception became our first challenge: How do you best convey the concept and uses of Notes (or groupware in general) as a new genre?

At first, we used a typical introductory chart presentation. But we soon discovered that this took too long to get to the point.

Then a realization hit us: Showing any one of many examples of Notes' numerous applications would be more effective. So we began making presentations to individuals or small groups with a demonstration on a laptop loaded with Notes.

Once people understood the basic concept behind groupware, it was time to continue training.

Our first Notes-specific education was to sponsor an in-house introductory application development course taught by Lotus. Prior to this, the participants' only exposure to Notes (if any) had been a 15-min. overview and demonstration. Even so, each one quickly grasped the concepts and the development process.

After the class ended, however, enthusiasm waned. We had expected a clamor for immediate installation and access to this wonderful new tool, but there was none. What happened?

> "THIS IS THE product that will take us that next step — nay, leap — forward toward workgroup productivity," we said. "Let's start telling everyone the good news."

Simply put, our Notes production environment wasn't ready. The reason was that much of what is typically thought of as the LAN environment is hidden from the groupware user.

For example, Notes has no disk drive letters to worry about, no cryptic file names to interpret. For system administrators, it's easy to get caught up in its simplicity.

Nonetheless, the same business-critical LAN management issues are behind what the user sees, including user and group ID administration, system availability, data backup and data security.

And the applications still require some development. While Notes is easy to install on the server, we must still address maintenance issues.

Above all, end users and application developers still need training. Though Notes makes it easy to "load and go," successful implementation for us means a production-level environment that can be used as a base for any application.

### Where to go from here?

It's difficult to maintain continued interest in a system that's "just there" — especially without available educational resources. So we remain a small installation (40 or so users) as we build our production system and add applications.

We're currently working with an in-house team on setting up more education. Training is one of the more difficult pieces to coordinate because people are so busy.

We are still excited about groupware tools that will produce productive change to our work flow. With its application development environment, E-mail and expansion options such as the fax gateway and connectivity to other E-mail systems, Notes is a natural fit.

Because of this wonderful new tool, my work has increased enormously. The tremendous payback, however, is worth it. Besides, I can use this tool myself. It's the first product since Lotus 1-2-3 that's really made that big jump for me.

Payne is a systems analyst at The Provident Life & Accident Insurance Co.

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**INSIDE EDGE**

## *Industry watcher says he expects big vendors to dominate the scene*

BY DAVID S. MARSHAK

Software vendors of every shape and size are seizing groupware as a new way to hook users. Yet successful groupware applications of the '90s will not come out of someone's garage.

High development and delivery costs mean that only major groupware players such as Lotus Development Corp., Microsoft Corp. and Borland International, Inc. are likely to dominate for the foreseeable future.

The following is a fast rundown on the strategies and directions of the major vendors:

### LOTUS

Lotus has taken a huge lead in market share and mind share. In fact, Lotus Notes has become almost synonymous with "groupware."

Announced in December 1989, Notes boasts an estimated 400,000 users. Another 2 million Lotus CC:Mail users represent a ready market.

Lotus intends to use Notes to anchor a whole new set of workgroup offerings known as "Noteware." These will include work flow, imaging and document management as well as information and software distribution applications.

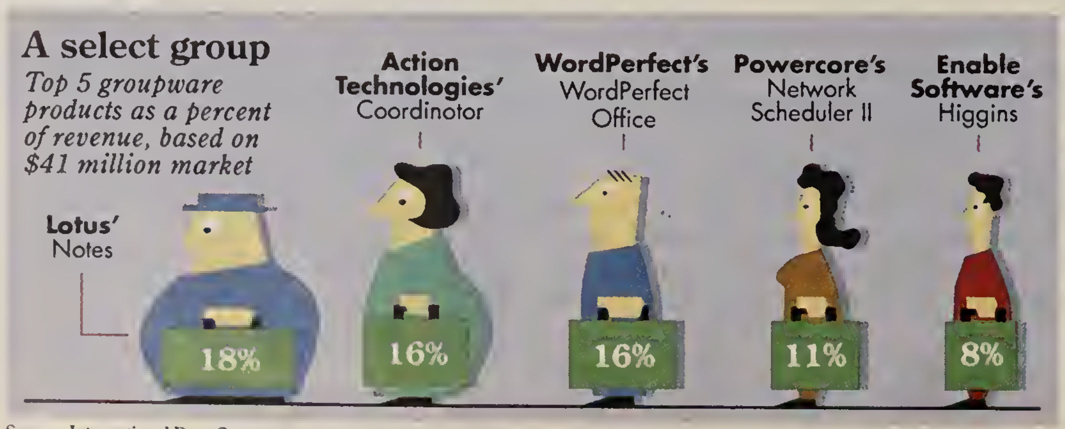
Hundreds of other companies are also reselling Notes or adding value to Notes applications, including Sandpoint Corp. in Cambridge, Mass., and Quality Decision Management, Inc. in North Andover, Mass.

### MICROSOFT

Microsoft is building a framework for workgroup applications. Windows Open Services Architecture will give any Windows application access to services such as electronic mail and directories.

A Messaging Application Programming Interface (MAPI) will also be offered for the Macintosh, DOS and OS/2. MAPI is being pitched as a cross-platform interface to messaging services.

Microsoft will build its own workgroup applications on MAPI and is encouraging other developers to follow suit.



Source: International Data Corp. CW Chart: Michael Siggins

### BORLAND

Borland has been coy about its groupware intentions. Despite a February announcement of directions, its plans remain a vague, moving target.

In contrast to Lotus' Notes, Borland is taking a "clientcentric" approach. The plan is to provide communications and workgroup support as an extension to current desktop personal productivity tools.

Borland is well-positioned to use its database technology, particularly InterBase, to build a transaction-based groupware environment. The Borland Object Component Architecture, if successful, should enable existing applications from any vendor to work with this environment.

The suspense may soon be over, however. Next week, Borland is expected to announce new products at the Groupware '92 show. Shipments might not begin until next year, though.

### Other big guns

Digital Equipment Corp. and Hewlett-Packard Co. will focus on work flow, while FileNet Corp. in Costa Mesa, Calif., and Plexus Software, Inc. in Sunnyvale, Calif., will concentrate on imaging. Small companies to keep an eye on include Keyfile Corp. in Nashua, N.H., and Reach Software Corp. in Sunnyvale.

IBM's strategy is less clear. It is supporting Lotus' Notes and has an agreement with Action Technologies, Inc. in Alameda, Calif. Still unclear is whether IBM will support Lotus' implementation of Action's product or offer its own work-flow product.

The other area to watch is the E-mail application programming interface (API) wars. Microsoft, Lotus, Apple and others are vying to create the accepted platform for building workgroup applications.

Until a single mail-enabling API is available, developers will be forced to choose camps. The outcome of these battles will go a long way in determining the future of the groupware landscape.

Marshak is a vice president and senior consultant at Patricia Seybold Group in Boston.

# Put to the test

*Usability labs can help you see if an application is going to fly with users or if you've created a dud — before you sink wads of money into development*

BY ALICE LAPLANTE

In the early 1980s, IDS Financial Services, Inc. rolled out a new mainframe-based CICS application it had developed in-house. The program was designed to help the company's customer service representatives more efficiently serve clients who called to update their files or request portfolio information.

The problem was, the application stunk.

Oh, the code *worked*. All its bugs and glitches had been ironed out through standard procedures, and there were no system crashes or significant performance problems. But the system — developed at a cost of tens of millions of dollars, according to Alan Bignall, vice president of financial planning — was virtually unusable. For instance, users who merely wanted to change or verify a customer address, which was a common phone request from IDS customers, were required, among other things, to go through a convoluted series of steps. These steps took users an average of 10 minutes — and sometimes as long as 45 minutes — to complete.

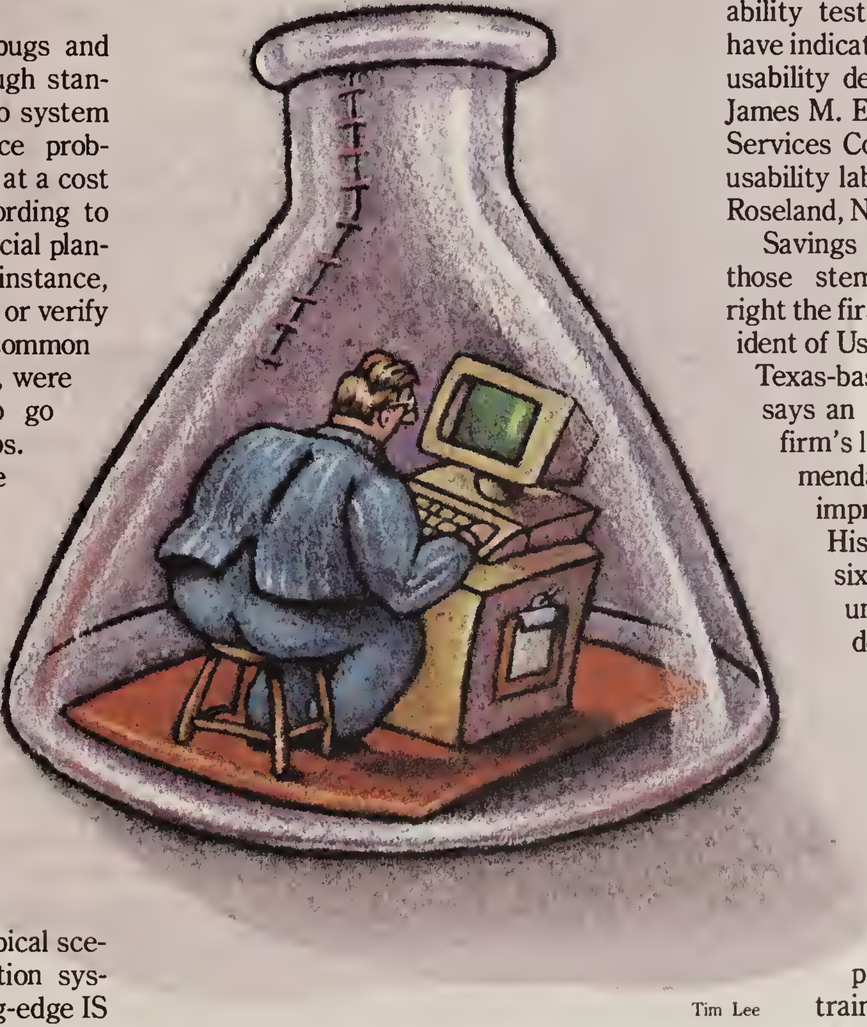
"This was a major engineering project for IS, and it affected hundreds, if not a thousand or more, employees every day," Bignall says.

The reason the system failed miserably was plain: Absolutely no attempt was made to discover whether the software worked the way IDS employees did.

Unfortunately, this is not an atypical scenario for most corporate information systems departments. But some leading-edge IS shops are railing against unusable software and are setting up, funding and managing what are known as usability laboratories. These labs can not only help user productivity but also save money by ensuring that software comes out right the first time and by minimizing the use of support resources.

The idea for usability labs made its way into Fortune-class IS groups from the personal computer software vendor community, which uses these facilities to ensure that commercial products are easy to set up, learn and use. In a nutshell, such a lab conducts usability tests in which typical users are observed performing typical tasks using a given hardware or software product. Any difficulties the users have learning or using the product are measured, noted and sent back to developers for correction.

Usability testing is a separate process from merely testing for bugs; test subjects aren't trying to crash the system. In fact, the assumption is that the application works from a technical point of view. Rather, usability tests are conducted to see whether the system makes sense from the user's perspective.


Tim Lee

That perspective has been brought in at IDS, where a $130,000 usability lab put in place in 1989 is ensuring that the company will never again repeat its "nightmare system" fiasco, says Kay Chalupnik, manager of the usability lab at IDS, a Minneapolis-based subsidiary of American Express Co.

## Spend 'n' save

Despite the expenses involved in building such facilities — costs can range from $60,000 to $200,000 for the more sophisticated labs — the savings resulting from usability testing can be substantial. Studies have indicated that each dollar spent early in usability design can save $100 later, says James M. Evans, an IS analyst at Prudential Services Co. who just completed building a usability lab for Prudential Insurance Co. in Roseland, N.J.

Savings on the development side include those stemming from "doing something right the first time," says Jeff Schueler, president of Usability Sciences Corp., an Irving, Texas-based consulting firm. Schueler says an average usability test run in his firm's lab will result in 70 to 100 recommendations of how the software can be improved from a usability standpoint. His firm tests software usability in six areas: installation, training, documentation, on-line Help, interface design and error recovery.

The payback for catching errors can be significant, Schueler says. For companies that don't do usability testing, "there are the additional training and support costs that a poorly designed system will incur: Users will take longer to learn the software and make more phone calls to the help desk after training is complete," he says. Furthermore, there is the lost productivity when users spend valuable time struggling to use the system to perform their day-to-day tasks.

Then there is the ultimate system nightmare: having to go back to the drawing board because an application has been completely rejected as unusable.

Studies are currently under way to quantify the savings involved in usability testing. American Airlines, which opened its 3,000-sq-ft usability lab in 1989, has found that catching a usability problem early in the design process can reduce the cost of fixing it by 60% to 90%, according to

*Continued on page 76*

## F.Y.I.

*American Airlines' Janice James says that Bob Crandall, CEO of the airline, came to visit the company's usability lab and was so impressed, he suggested that James start a user group. She founded the Usability Lab User Group in 1991. Today it has 250 members. Here are the pertinent facts:*

- First official conference in August at WordPerfect Corp. in Provo, Utah.
- Quarterly newsletter.
- Directory that permits members to contact one another directly.
- For more information, contact James at (817) 963-2785.

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Laplante is a free-lance writer based in Palo Alto, Calif.

*Continued from page 75*

Janice James, manager of American Airlines' usability lab in Dallas.

The most basic usability lab setup involves two rooms connected by a one-way mirror. The testing room contains the computer equipment on which the target applications will run, a video camera that will capture the subject's reactions to the system and some sort of two-way audio system so that lab staffers in the observation room can communicate with subjects in the test room. Observers may include lab directors with human factor or psychology backgrounds working with cross-functional teams including developers, programmer/analysts, users, support personnel and business managers.

Most labs have two or even three video cameras so that a user can be videotaped from a number of different angles. Summary videotapes can be created using video-editing facilities to combine highlights of various tests.

Logging software that records keystrokes and measures lulls in keyboard activity is helpful although not absolutely necessary. American Airlines opened its lab using just a notepad and a stopwatch.

The kinds of problems usability testing uncovers can include cumbersome or counterintuitive ways to perform basic functions, such as the lengthy series of screens and menus IDS' software had for users to change a customer's address.

Another common problem is obscure and jargony words or phrases used to describe a menu selection. Documentation can be unintelligible or poorly indexed, and keystrokes for basic functions can be inconsistent from one part of the application to another. For example, pressing F1 might bring up on-line Help in one module of an application but close a session in another — a usability no-no. On a more superficial level, the colors on the screen could be distasteful or jarring.

"Several years ago, people were overjoyed simply if a system worked," says Jackie Schrier, a senior research scientist at the Bedford, Mass.-based American Institutes for Research, which performs usability consulting. "Now, IS departments are working at a higher level and want to ensure they are maximizing user effectiveness."

### Test early and often

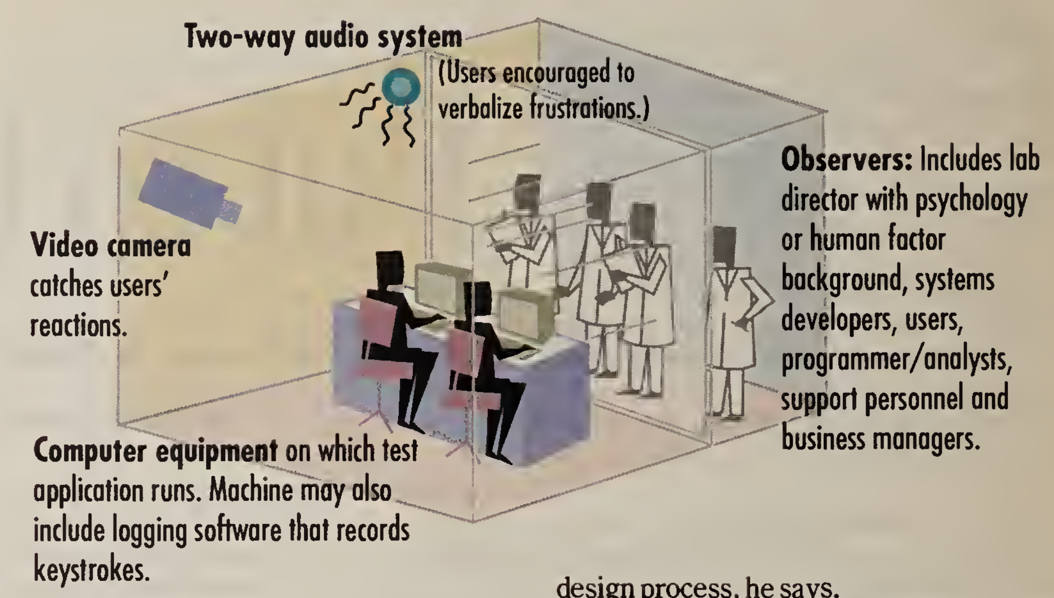
While usability labs minimize the chances of unfriendly software, experts caution against the notion that a usability lab is where finished software is sent just prior to release. They also warn against equating a high-tech facility with results.

"The lab is just a tool; what's more important is the process through which the tool is used," says Dave Rinehart, a partner at consulting firm Usability Systems, Inc. in Atlanta. "People think that building a sophisticated room that contains the appropriate video and sound equipment means they have a usability lab. But if they don't have a sound methodology, it won't do any good."

For example, improperly designed tests could mean that an IS organization is simply validating what it already believes about user interfaces instead of investigating what is really happening in the user community, Rinehart says.

## Dissecting the lab

*Usability labs can cost from $60,000 to $200,000. Here's what a basic one contains:*


**Two-way audio system** (Users encouraged to verbalize frustrations.)
**Video camera** catches users' reactions.
**Computer equipment** on which test application runs. Machine may also include logging software that records keystrokes.
**Observers:** Includes lab director with psychology or human factor background, systems developers, users, programmer/analysts, support personnel and business managers.

"Usability testing should begin as early as possible in the development process," American Airlines' James says. That way, developers can fix problems as they happen rather than having to redesign the entire application.

Tom D'Onofrio, a senior staff programming analyst at IDS, first used the company's laboratory while designing a new set of integrated, PC-based financial planning tools. Although some preliminary prototypes of the system had been built by the programming team, the usability tests took place fairly early in the design process, he says.

"As a result of what we learned, we went back and did a series of restructuring designs to the system, says D'Onofrio, who feels that "balanced" use of the lab — falling somewhere between a free-for-all brainstorming session and simply asking users for feedback on specific screens — is the most helpful approach.

James says she tries to bring new software products into her American Airlines lab at least four times during a development cycle:

- In the design phase, after a user's needs analysis has been done but before coding has commenced.
- After the application has been prototyped.
- During alpha testing.
- When it's time for a beta release.

"Early design walk-throughs allow users to look at screen designs in order to check the work-flow logic and make sure that menu terminology makes sense," James says. "You can get quite a bit of valuable feedback before any actual coding has begun."

Prudential Services' Evans agrees. "Bringing an application into the lab at the end of the development cycle is usually too late," he says. He adds that although testing at the end of the cycle is better than not testing at all, usability experts should be involved from the moment a new application idea is conceived.

According to Evans, a great deal of up-front work must be done before an application is brought into the lab. Even before programmers get involved, analysts should sit down with end users and break down the things users do (e.g., filing an insurance claim) into a series of tasks.

They should then design successive screens that take into account issues such as the order of the tasks, color combinations and the objects or choices that will be displayed to the user at any given time.

"Once you have a fairly robust prototype that shows how screens will appear and in what sequence, you are ready to bring users into the lab for the first time," Evans says. At this point, actual coding of behind-the-scenes processing or functionality hasn't yet begun; analysts are still determining key work-flow issues. Only after those issues are determined does programming of application functionality begin.

### Simulating the real world

Usability experts say the tests run in a lab should mirror the real working world. For example, if a new insurance claims processing system is being tested, users

*Continued on page 80*

## Every move you make, they'll be watching you

What do usability experts watch for when conducting a test? Everything.

They note all the following evidence during the two to three hours users spend in the lab: verbal comments, facial expressions, the time it takes to complete a specific task, the errors made and the number of times the user has to refer to documentation.

Don Ballman, manager of the usability lab at Mead Data Central, looks for the number and frequency of errors and for excessive "dwell time" — when users are uncertain how to proceed. But a certain number of errors and a certain amount of hesitation is normal, experts say.

"It's important to look for changes to errors made over time," explains Ballman, who says you have to assume users will make some mistakes on an unfamiliar system. "But if they keep making mistakes . . . you've got a problem."

Verbalization is instructive, as is after-the-fact analysis. Ballman will often divide a test into two parts: The user will spend the first hour at the keyboard going through the tests; during the second hour, the subject will review the videotape of his progress.

"Things might click in retrospect, or a subject will understand why he or she didn't get something the first time around," Ballman says. These after-the-fact qualitative comments are extremely valuable, not only for figuring out what is wrong with the system but also for realizing what is right and getting ideas for fixing the problems.

"We look for things such as the number of times a particular error occurred and how many users had that problem," American Airlines' James says. A telephone hookup to a simulated "help desk," actually someone in the observation room who understands the product being tested, can also be useful. This support interaction can give an indication of how often the person will be forced to ask for help when using the system and can point out trouble areas.

Usability Systems' Rinehart says it can also be instructive to take away documentation and let users struggle through a piece of software on their own. "By letting users struggle and seeing if they can figure it out on their own, we can sometimes decide whether we need an additional prompt or a special section in the documentation," Rinehart says.

### Choosing Joe Typical User

Experts caution that selecting *whom* to bring into the lab to perform the tests is an important consideration.

"The common way in the past was to say, 'Let's have Joe use the system — he's been working on it for five years and knows it inside and out,' " Prudential Services' Evans says. "But that inside knowledge is precisely why Joe shouldn't be a test subject: He isn't the average user."

It is critical to figure out who the typical user will be and to get an adequate sampling, Evans says. For example, the actual user population might be a combination of computer novices and experienced users.

Evans recommends a bare minimum of four test cases; the best results come from having 8 to 10 users. "After 10 people, you tend to get diminishing returns," he says. "You'll still catch problems, but 95% of your usability issues will have been flagged already."

Ballman says there are two important considerations to take into account before bringing a user into the lab: the user's existing business knowledge and computer skills and the environment in which the software will be used.

This second point is key because while difficult to do in a lab, simulating the workplace is essential, Ballman says.

"The phone goes off, the secretary comes in, a meeting is called, and work gets interrupted all the time in the real world," Ballman says. "A significant part of usability is how well a piece of software can be used in this type of environment. For example, if you've been interrupted, how easy is it to figure out where you were and what you were doing?"

Evans says it's important to put participants at ease before testing begins. "You need to emphasize that you are testing the software, not them," he says. "They need to know you are consulting with them because they are the experts and you value their opinion."

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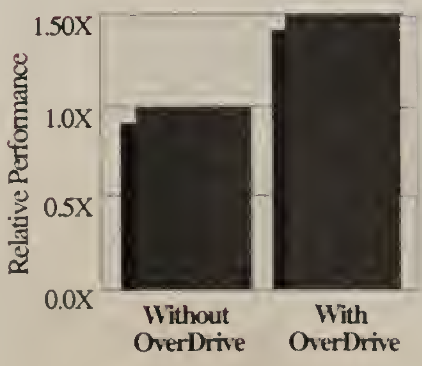

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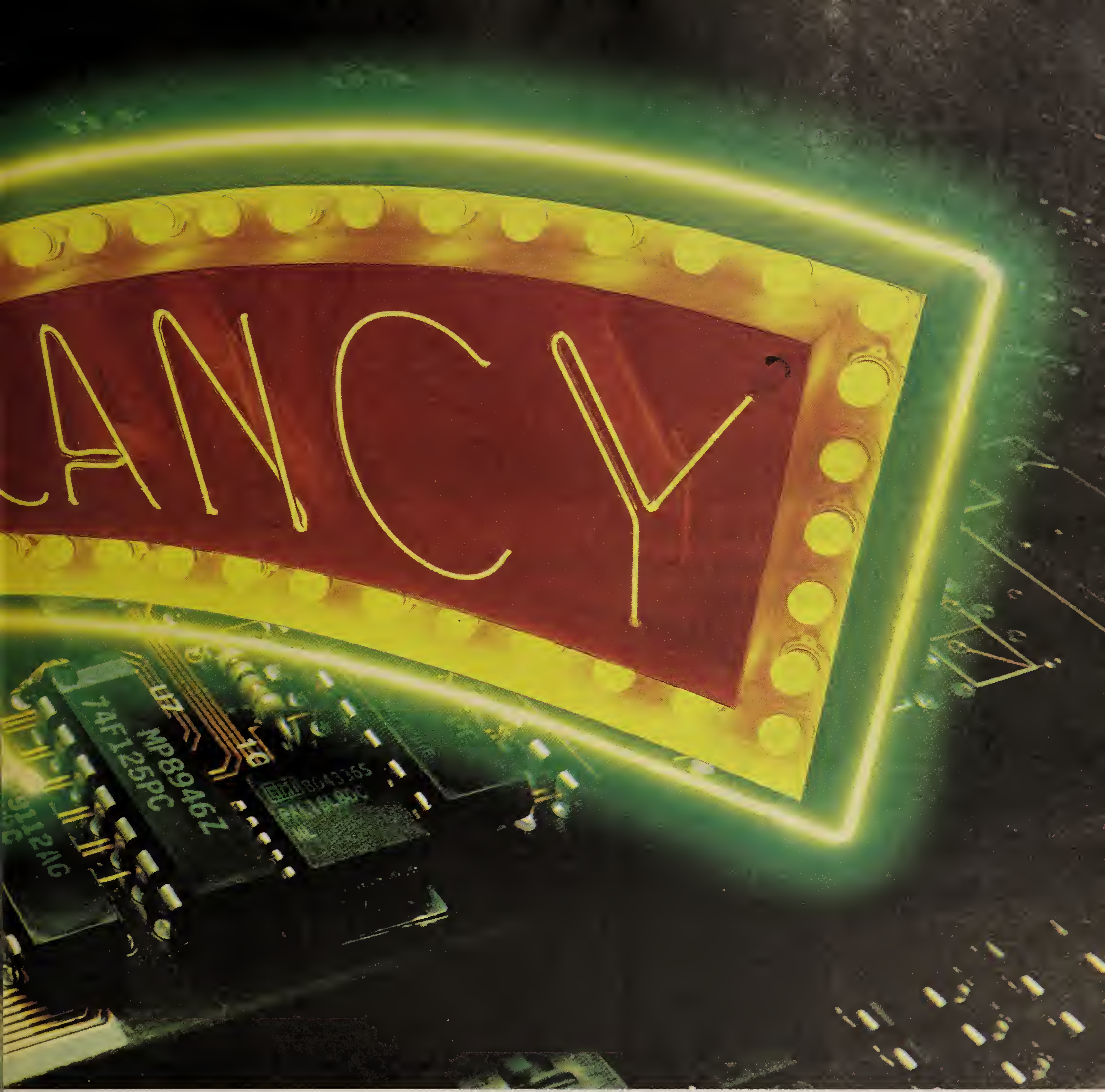

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*Continued from page 76*

should attempt to go through every stage of filing a claim, just as they would if they were sitting at their desks. In certain cases, they are asked to bring along actual claims paperwork from their desks.

Often, usability staff members will be aware in advance that certain aspects of the application are questionable; they will then design tests specifically to confirm or deny their suspicions.

"For example, in one application, we suspected that the phrasing used in the menus was too jargony," James says.

The phrase "Flight Monitor" was the title assigned to one pull-down menu that allowed users to check whether a given flight was on schedule. "When our users stumbled over that particular phrase, we knew our suspicions were correct," she says. The phrase was subsequently changed to "Arrival and Departure Times."

At Mead Data Central, the maker of Nexis and Lexis on-line database products, setting quantifiable usability goals is just as important as making sure the simulation is based on the way users really work. For each product tested, developers, users, support personnel and anyone else involved in a particular project are asked to contribute to a "usability certification," such as reducing training time by 50% or reducing help desk calls by 30%, says Don Ballman, manager of the usability lab at Mead Data.

"This way, we have specific objectives in mind throughout the development process," Ballman says.

Mead Data's lab has been in operation since 1989 and tests all internally developed software.

Ballman says more organizations are including usability experts in the development process because they finally perceive that understanding what the user wants is more essential than bolting on additional bells and whistles at the end of the cycle. James estimates that there are currently about 300 labs in operation.

"People are realizing that usability is much more than just a pretty face," Ballman says. "In the past, it was assumed that because people can learn, it's easier for them to adapt to a system than for the system to adapt to them. At the usability lab, we have the opposite premise." •

## Developer angst

One of the most critical aspects to the success of a usability lab is that IS developers "buy into" the process. After all, it doesn't do any good to discover problems in a piece of software if the programmers refuse to acknowledge the validity of the findings.

"There is a natural resistance to someone not familiar with the process," says American Airlines' James, who adds that most developers are usually under a tight deadline and can resent any interference with getting a product out the door. Once they are brought into the lab and can observe users struggling, she says, that resistance usually melts.

"As a generative device for getting ideas from users, it works well," IDS analyst Tom D'Onofrio says.

The IDS usability lab recently ran a series of usability tests on prototype pen-based systems, which are expected to enhance the productivity of IDS representatives, who are often at customer offices, homes or even outdoors when they take down critical data.

IDS brought in IBM — its chosen pen-based vendor — and internal developers to see how users reacted to screen color, readability and other issues involved in pen input.

"Once vendors and developers see actual users struggling, they become true believers," IDS' Chalupnik says.

"We encourage the developers to come in and observe the tests as much as possible," says Prudential Services' Evans, who notes that the Prudential lab was soundproofed for this very reason. "Developers are possessive of their efforts and tend to get a little verbal if they see someone having a problem."

D'Onofrio agrees. "You really want to jump in and explain," he says.

But because the success of a usability lab depends on its providing developers with an objective and balanced "reality check," independence is critical.

If the lab is too closely aligned with IS, there can be subtle but disastrous biases built into the testing process, especially when the systems staff is under pressure to deliver projects on time and on budget.

Having a lab that strikes a balance between the user community and IS is therefore essential, Chalupnik says, adding that she must constantly remind developers reviewing the results of a particular usability test where their responsibilities lie.

"My job, in effect, is to keep asking, 'Well, what did your user say?' when a developer balks at a conclusion," Chalupnik says. "If necessary, I'll replay the videotape until they get the point."

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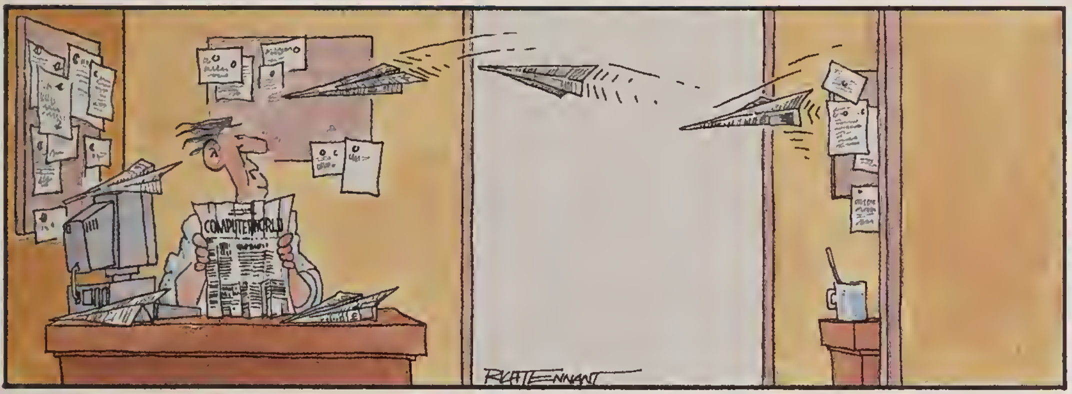

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IN BRIEF

## Having it both ways

- It's a data center. It's a trading floor. It's a data center *and* a trading floor — and the first of its kind, according to executives at the **Boston Stock Exchange.** The planned autumn move of the exchange's downtown Boston data and communications center to a new suburban facility is aimed at garnering greater space at a lesser cost, one executive said — and more: The 10,000 sq-ft space is being designed to serve as an emergency backup trading floor.

- **Ernest Waller** was recently ensconced at **FloridaBank** as the Jacksonville, Fla.-based federal savings bank's assistant vice president and manager of information systems. Before taking this position, Waller served as assistant vice president of telecommunications at Florida National Bank, also based in Jacksonville.

- This Thursday is the scheduled opening day for **Metropolitan Life Insurance Co.**'s new computer center in Rensselaer, N.Y. The 212,000 sq-ft facility, which takes over from the company's current New York-based data center and will house systems and software development laboratories as well, will start out with 100 to 125 employees and staff up to some 225 over the next year. It also brings two particular strengths to Met Life's IS: dedicated disaster recovery capability to support the firm's three other data centers in Pennsylvania, Kansas and South Carolina, and proximity to a wealth of colleges and universities apt to provide a broad pool of technical talent.

- The **Federal National Mortgage Association,** better known as **Fannie Mae,** elected **Barbara B. Lang** to the post of vice president of its corporate IS division. Lang, a 27-year IBM veteran, will manage the day-to-day administrative and control functions of the 600-person department and create systems aimed at placing the latest technologies at Fannie Mae's service.

# Treasury Department's wild ride

*IS personnel wrestle with massive 10-year, $850 million network procurement plan*

BY GARY H. ANTHES
CW STAFF

The U.S. Department of the Treasury is facing a management challenge about as daunting as one could imagine: a 10-year, $850 million project to recast its communications systems, committing to a vendor partnership that will endure long after the technology originally chosen has become obsolete.

And, just to make the exercise a little more interesting, those managing the huge deal have 42 different constituencies to satisfy: executive management, systems management and users at each of 14 Treasury bureaus, including the Internal Revenue Service (IRS), the U.S. Customs Service, the U.S. Mint and the Secret Service.

"I worry about it a lot," says Steven W. Broadbent, the Treasury Department's deputy assistant secretary for information systems. "I worry about the complexity of Treasury and the missions we're responsible for. We have everything from law enforcement to financing the public debt and a heck of a lot in between, and we're trying to meet those mission needs with a single network program."

Nevertheless, outside observers say the agency has taken extraordinary pains to minimize the project's inherent risks and has put together a procurement plan that could become a model for other large systems projects in the government.

The Treasury Department, which will spend $2.2 billion on IS this year, is now soliciting bids for the design, implementation and operation of a departmentwide communications system, which will act as a utility to provide voice and data services to the bureaus.

The system will be augmented by the agency's existing Federal Telecommunications System 2000 (FTS-2000) arrangement with Sprint Corp. (see story page 82).

Steven Turk

Called the Treasury Communications System (TCS), it will succeed the Consolidated Data Network now managed by Computer Sciences Corp.

"They are one of the few — maybe 10 — government agencies or commercial enterprises to have taken a step back and looked at all the elements of technology — networking, applications, databases and so forth — and set up a strategic plan for all of them," says Francis Dramis, chairman and chief executive officer of Fairfax, Va.-based Network Management, Inc.

The TCS procurement moves away from the practice of issuing hundreds of pages of detailed hardware and software specifications, many of which are obsolete by the time the vendor delivers the goods.

Instead, the TCS request for proposals (RFP) lays out functional requirements and asks vendors to come up with solutions.

"It's an extremely open-ended, flexible structure," says Warren H. Suss, president of Warren H. Suss Associates, a federal market consultancy that is based in Jenkintown, Pa. "This is where the government has been trying to get to in its acquisition process. This is in some ways a model procurement."

While that approach has much merit, it also puts a significant burden on the procuring agency, says Larry Seidel, vice president and head of civilian government programs at American Management Systems, Inc. in Arlington, Va.

Evaluating a range of alternatives and gauging their price/quality tradeoffs, Seidel said, is "much more difficult than just going down a checklist and saying, 'Does it meet the spec?' "

*Continued on page 82*

## WANTED: Systems provider

The Treasury Department's briefcase-busting RFP — the table of contents alone runs 28 pages — contains provisions likely to make bidders on the $850 million information systems overhaul sit up and take notice.

And Treasury hopes those terms will keep the winner — most likely a systems integrator teamed with a telecommunications carrier and a gaggle of subcontractors — on the tip of its technological toes for all 10 years of the resulting contract.

The RFP contains a "technology refreshment" clause, directing the contractor to propose "enhancements" aimed at lowering costs, improving service, adding functionality and boosting reliability of the network. The government reserves the right to demand demonstrations of the enhancements and to reject them for any reason.

In return, the contract for the Treasury Communications System will contain an incentive program that rebates to the contractor fees based on cost savings and other improvements made.

Each year, Treasury will put funds in a kitty expected to be between 1% and 3% of the estimated annual contract price. Payout of the pool depends on contractor performance in three basic areas:

- **Contractor responsiveness:** customer satisfaction, user support, maintenance effectiveness and 13 other subcategories.
- **Network performance:** network delay, availability and mean time to restore.
- **Cost management:** based on an index that compares contractor prices with comparable commercial services.

"In the traditional government contract, the only way the contractor can make money is to sell us something — a new service, a new box," says Steven W. Broadbent, deputy assistant secretary for IS. "Here, if the contractor works smarter, we will give them a bonus on an annual basis."

GARY H. ANTHES

# Data centers get the halon out of there

*But managers trying to replace the fire retardant are discovering the alternatives aren't so hot*

BY GARY H. ANTHES
CW STAFF

Halon's days may be numbered, but users are far from united in their search for a replacement for the computer room fire-fighting chemical.

"Some companies are saying, 'I'll just wait until the manufacturer comes and sells me an alternative,' but that may not happen," said Thomas Cortina, executive director of the Halon Alternatives Research Corp. "None of the candidate agents right now is a definite winner."

Du Pont Co., the largest producer of halon, recently said it will stop production of the controversial gas by the end of 1993 — one year earlier than it had previously promised. The firm simultaneously announced the availability of FE-13, a halon alternative [CW, July 20].

But the new halon-like alternatives are far from perfect. According to fire protection experts, drawbacks include high price, toxicity, poor performance and risk of environmental damage, not to mention unperfected delivery systems.

Stan Slonski, product manager for fire suppression systems at Kidde-Fenwal, Inc. in Ashland, Mass., said halon systems converted to FE-13 use could retain their fire-detection components — typically about half of the system's overall cost.

However, Slonski added, the conversion would require completely new storage tanks and delivery components — parts that cost about three times as much as the halon equivalent.

A halon system with automatic sprinklers for backup will remain in place at the Washington, D.C.-based Smithsonian Institution's main data center, fire protection engineer Robert Wilson said.

Any new systems, Wilson added, will use sprinklers only until a good halon alternative is found.

**Two choices**

In fact, Cortina said, most users are showing one of two responses to the federal moratorium on the production of halons and chlorofluorocarbons, which deplete the Earth's protective ozone layer: either doing nothing or falling back on tried-and-true means of protection such as automatic sprinklers and carbon-dioxide systems.

According to Paul Harris, sales vice president at Chicago-based Ascoa Fire Systems, companies including The Boeing Co., Ford Motor Co., General Motors Corp. and Chrysler Corp. are actively phasing out their halon systems in favor of water sprinklers and/or carbon dioxide systems.

Harris said the companies are worried about accidental discharges and the possibility that the government could levy a stiff user tax on halon. A current sales tax on halon of 25 cents per pound will jump to $26.50 on Jan. 1, 1994.

ACCORDING TO fire protection experts, drawbacks to halon alternatives include high price, toxicity, poor performance and risk of environmental damage.

# Treasury Department's wild procurement ride

CONTINUED FROM PAGE 81

In addition to giving vendors more freedom to craft their own approaches, the RFP makes funds available each year to reward superior vendor performance (see story page 81).

"We'll be constantly challenging the integrator to do business more efficiently and effectively," says James J. Flyzik, director of Treasury's Office of Telecommunications Management.

If the vendor "can demonstrate ways to save the government money on a cost-per-packet or cost-per-user or some other basis, we'll return some of those savings," he says.

Not all of the agency's challenges are associated with selection and management of a vendor. Most of Treasury's 163,000 employees are likely to be touched by TCS in some way, and managers and users in the various bureaus have vastly different requirements.

Andrew P. Snow, a vice president at Network Management, which helped Treasury prepare its RFP, says TCS will have to satisfy three groups at each bureau.

"Top executives look for effectiveness in meeting the agency's mission," he notes. "Systems managers look for efficiency. And users are selfish; they just want to get the job done."

Forging a consensus among these three groups is no simple task, Snow says.

"Like all common user networks, it's very important to win the hearts and souls of users. But no one wants to be the sacrificial lamb for the greater good; no one wants to relinquish control," he explains.

**Not all aboard**

Nevertheless, Snow reports success so far, in part because Treasury management held hundreds of interviews with users and their managers during the three years spent developing the requirements that led to the RFP.

"People are pretty much on board," Broadbent agrees, "but I'll admit we don't have total consensus."

Broadbent says his staff told the bureaus that they could avoid the headaches of managing their own networks by signing on to TCS as a utility.

In addition, Broadbent says he enticed the bureaus — especially the smaller ones — with the promise of better prices and more services than they could effectively buy on their own.

**Broadbent** *corrals IS for Treasury Department*

**Shackled**

Despite all the effort that has gone into defining requirements, building a consensus and structuring a deal calculated to lead the vendor down the right path, Broadbent says he still feels handicapped by federal procurement regulations that say bid evaluation criteria must be objective and precise.

"For me, developing relationships is what defines the success of the program, not looking at who brings the best networking architecture to the table, because by the time we get to Year 5, whatever was bid will probably not be in place anymore," Broadbent says. "What I'd do differently if I didn't have all these procurement regulations is put a lot [of emphasis] on how comfortable I feel based on the future relationship."

Broadbent adds, "Are we trying to do too much? I'm convinced we're on the right path, but until we get there, we won't know."

### Treasury Communications System (TCS) at a glance

*In the next decade, the U.S. Treasury Department plans a massive network overhaul*

**What and when...**

***Now***

- 50,000 users at 3,700 worldwide locations.
- Network traffic 5.7G bytes a day.

***By year 2000:***

- 400,000 users.
- Network traffic 700G bytes a day.

**...and how**

***The Treasury Department environment***

- Proliferation of bureau-based LANs.
- Move to client/server computing.
- Huge growth in file transfer applications, driven by new tax systems.
- Explosion in laptop computers to serve 10,000 users who will require dial access to TCS.
- Growth in imaging applications for law enforcement.

***The TCS internetwork will consist of three logical pieces:***

- A private subnetwork dedicated to the Treasury's use.
- An FTS200 services subnetwork.
- A commercial services subnetwork offering third-party services.

Source: U.S. Department of the Treasury

CW Chart: Michael Siggins

BOOK REVIEWS

## Flexibility: The future of business

**The Virtual Corporation**
By William Davidow
and Michael Malone
*HarperCollins Publishers,*
*$23.00*

Imagine a huge business enterprise where there are no middle managers; workers' job descriptions are intentionally vague and their daily activities are subject to constant change; and each day's products are individually customized in response to the orders placed the day before.

That is a rough picture of the "virtual corporation" as set forth in this well-written, emphatically argued book. The authors describe virtual products as those produced and customized more-or-less instantaneously in response to specific customer demands. They also describe the radical restructuring necessary for most American businesses to produce virtual products. The authors assert that such change will dictate the success of U.S. firms in the very near future.

Not surprisingly, the enabling force behind all of this change is the dramatic rise of information processing power. *The Virtual Corporation* cites just-in-time inventory control, electronic data interchange and other technologies as contributors to the advent of the new, flexible structure of future businesses.

The book challenges information systems managers to think of their role in business re-engineering as a never-ending process.

**Turn Signals are the Facial Expressions of Automobiles**
By Donald Norman
*Addison-Wesley Publishing*
*Co., $21.95*

If you think about information systems all day long, why go home and read a book about IS? Give yourself a break and flip through *Turn Signals.*

The book is a sharp, humorous critique of the follies of design that surround us in everyday life. (Do you accidentally turn on the stereo instead of the VCR or television because you have three remote control units scattered in the living room?) The relevance to IS is this: Applications and systems designers will find that *Turn Signals* challenges their empathy for the needs of end users.

*Turn Signals* is a loose collection of the author's thoughts on a variety of topics. IS managers who want a useful book without all the network protocol acronyms should take a look.

*Reviews by Derek Slater*

# Attitudes still a barrier for the disabled

*Job seekers with disabilities hope legislation will make a difference, but they aren't betting on it*

BY ALICE LAPLANTE
SPECIAL TO CW

Blindness did not prevent programmer Dan TeVelde from seeing that he was being discriminated against in his last job search because of his disability. At one place he applied, he heard through the grapevine that he didn't get the position because of his guide dog.

At another corporation, one of two key programming tests TeVelde had to take wasn't available in a Braille format.

TeVelde later found work at McDonald's Corp. in Oak Brook, Ill., as a Cobol and job control language programmer in financial systems development, but it took him many frustrating months. "I should have been more firm, but instead I just went on to the next interview," says TeVelde, who has been employed at McDonald's for more than two years.

## Help on the way

At least in theory, a job search shouldn't present that kind of frustration anymore for TeVelde or any other physically challenged individuals thanks to the Americans with Disabilities Act (ADA), which went into effect yesterday for companies with 25 or more employees.

Whether that will be true in practice remains to be seen.

The ADA prohibits employers from discriminating against qualified disabled persons in hiring, and it mandates that they make "reasonable accommodations" that enable such persons to perform essential job functions.

Having a law on the books and actually enforcing it can be two different things, however, and not everyone is sure that you can get rid of job discrimination that easily.

"Don't get me wrong: I think the ADA has helped, but it lacks the teeth it needs to be actively enforced throughout the private sector," says Tom Janus, information systems director at McDonald's, which has been hiring disabled technical workers for the last six years.

Doug Haynes is slightly more hopeful. Haynes, who is visually impaired and works as a help desk operator at Informix Software, Inc. in Menlo Park, Calif., says that although disabled IS workers still need to aggressively seek out employment opportunities, the new law should help.

Haynes knows the value of a legal persuader. It took him 15 months to find an IS position after completing his programming certification at a local technical institute, and even then he probably wouldn't have succeeded if he hadn't steeped himself in state and federal regulations.

"I did extensive research and went to job interviews armed with each and every law regarding the employment of disabled persons," Haynes recalls. Indeed, he credits his being hired at Informix in part to the fact that he pointed out tax laws that give tax credits to organizations that hire disabled persons.

## Be prepared

Charlotte Corbett, an adaptive computing technologies specialist at the University of Massachusetts at Boston, recommends that disabled persons seeking IS careers go to interviews armed with precise facts on the enabling technologies they will require.

"Most adaptive measures cost under $100 to implement," Corbett says, but many employers don't realize that and are concerned about the costs of voice synthesizers, screen magnifiers or alternative input devices and other adaptive devices.

"Disabled workers should go into the interview saying, 'Here are my skills, here's the technology I need to do my job, here's the cost, and here's where you can buy it,' " says Carl Brown, director of the High Tech Training Unit of the California Community Colleges, a statewide network of centers where disabled students and staff receive training on adaptive technologies that will aid them in both academic and professional careers.

Haynes found this to be critical in his own job search. "I have $6,000 worth of my own equipment sitting on my desk," Haynes says. A voice synthesizer reads aloud the text that appears on his screen; he also has a special closed-circuit television system that magnifies the display.

Although not expecting overnight change, many are optimistic about the ADA's long-term effects. "Without question, the ADA will open doors," says David Clark, an undergraduate student in cognitive science at the University of California at Berkeley who has cerebral palsy and has worked summer internships as a programmer at Pacific Bell in San Francisco.

"The fact that organizations will be legally mandated to provide assistance to disabled persons will really make a difference," Clark says.

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LaPlante is a free-lance writer based in Palo Alto, Calif.

## What the law lacks

The ADA does not provide any affirmative action guidelines, nor does it specify any punitive measures against companies that don't comply. Moreover, the law doesn't say how companies are to make — or fund — these accommodations. As such, experts say, the ADA is unlikely to force immediate changes in the hiring of disabled persons in IS shops, for the following reasons:

- Fears about the cost of accommodation technologies and the productivity of disabled workers remain high among many employers.
- Only a minority of IS organizations have actively prepared for accommodating disabled employees. Instead, most say they are taking a wait-and-see attitude.
- The burden of proof will fall on the disabled individual — not the corporate entity — to enforce and test the scope of the new law.

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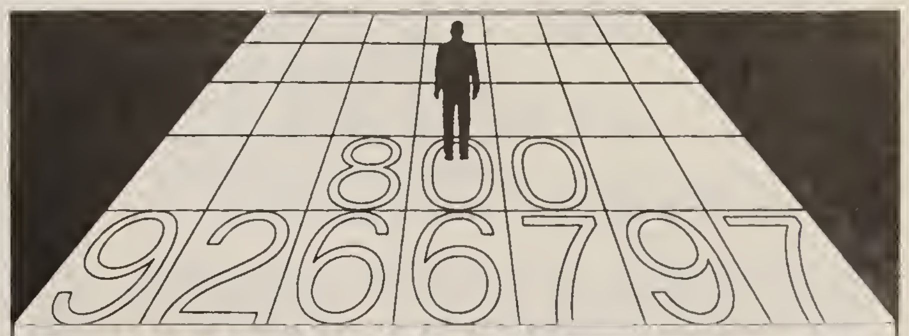

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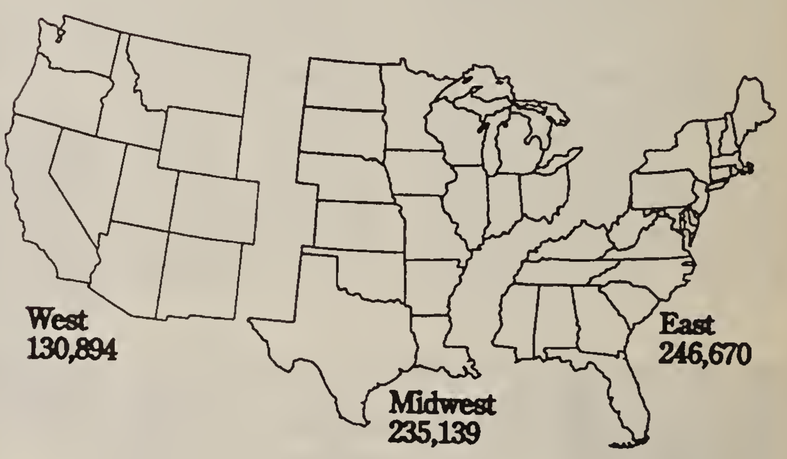

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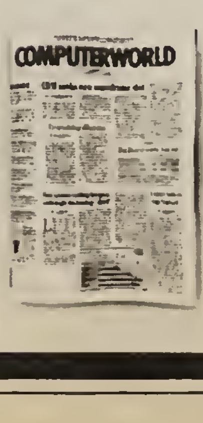

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# Honing business skills can't hurt

*Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Max Messmer, chairman and chief executive officer of Menlo Park, Calif.-based Robert Half International, Inc., which places information systems professionals in the U.S. and abroad.*

Q **I keep hearing that IS professionals need to develop their business skills to improve their career prospects. Yet as a programmer with more business experience than many of my colleagues, I have never encountered a prospective employer who cared about anything but my technical credentials.**

**Why is this?**

A You may be encountering this reaction because employers typically look for different skills as you move up the career ladder. As a programmer or programmer/analyst, your depth and breadth of technical knowledge are overwhelmingly the determining factors in your marketability.

On the other hand, if you advance to be a systems analyst, project leader or manager, your employer will most likely put a higher value on your overall industry knowledge as well as your specific business management and interpersonal skills.

Q **I have three years' experience as a VM/CMS REXX programmer. I have some personal computer experience. In addition, I had Cobol in school and I had a class in C at work, but I haven't had a chance to use it.**

**Am I pigeonholed in my current position?**

A Your knowledge of Cobol and mainframes is important. But the IS world is moving quickly toward newer technologies, such as cooperative processing, open systems, object-oriented coding and graphical user interfaces.

You should continue to learn OS/2 and C at work and concentrate on these newer technologies to stay current with IS trends.

**FAST TRACK**

CAREER ADVICE FOR THE '90s

Q **Can you tell me the best way to go about finding schools that teach fourth-generation language/SQL programming?**

**I have a bachelor's degree in mathematics and computer science, but it was completed in the early 1970s, and at that time, I did a lot of Fortran programming.**

A As part of its computer science curriculum, almost every university offers courses in databases, languages and software construction. These fundamentals are the basis for 4GL/SQL programming.

Your Fortran programming experience is very different from the structured coding, or "English-like," relational nature of 4GL/SQL, but the process of learning a language is similar and you should have very little trouble.

Q **As a computer engineering student, I'd like to study Unix. I've tried several companies, but none produces a Unix in a student's price range. With Unix becoming so dominant in this field, I don't want to be left playing with DOS. What can I do?**

A There are several ways to access Unix at minimal or no cost. One way is to approach a professor at your school and offer to help on a Unix-based project.

You could also try volunteering at a local nonprofit association that has a Unix system. The group will appreciate your computer experience, and you'll get the chance you need to learn the system.

You can also look into computer clubs, public computer networks or electronic bulletin boards that list ways for an individual to learn new systems at low cost.

☞*We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.*

## TIP *of the* MONTH

### *What's the best way to make sure you understand user requirements?*

➤I go out on the road with users to see how they evaluate psychiatric units in hospitals. We have also started classes twice a month for junior analysts that focus on giving users what they want: being better listeners and communicators.

*Deborah Swank, systems analyst*
*Ohio Department of Mental Health, Columbus, Ohio*

➤We have a written request procedure where users write out what they want done. It's the only way we can keep track. These written requests allow for as much detail as the user knows. Then we make sure the user is requesting the right thing and that it's in line with our guidelines.

*Joe Woodhouse, systems analyst*
*John Deere Foundry, Waterloo, Iowa*

➤You have to put yourself in the user's place. I go to their location and get them to brief me initially. You need to understand the process from the beginning to the end, so I pretend I'm a new employee and have them walk me through the process.

*Ricardo Marrero, systems analyst*
*Engineering Dept., St. Petersburg, Fla.*

➤We have varying levels of user proficiency, so you have to get a feel for what level they're at when you're describing what you plan on using. What's comfortable for one person from an input standpoint may not be comfortable for another.

*Mark Vogt, financial systems analyst*
*National Processing Co., Louisville, Ky.*

➤Sometimes I will draw a map for the user that shows the stages of development and how long each stage will take. I think it's very effective. Sometimes they agree, and when they don't, they draw their own diagram.

*Henry Grey, systems analyst and technical support*
*Nynex Information Resources*
*Systems Technology Department, New York*

*Compiled by Kathleen A. Gow, a free-lance writer based in Medford, Mass.*

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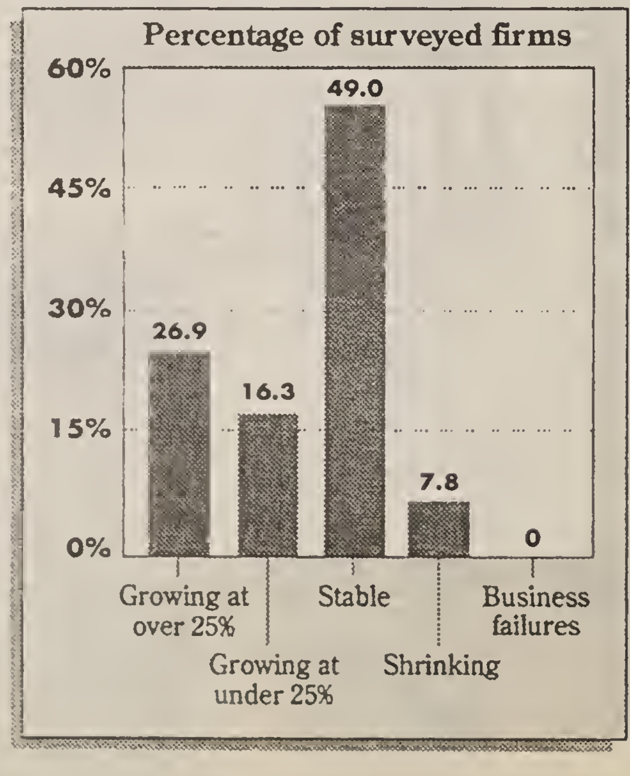

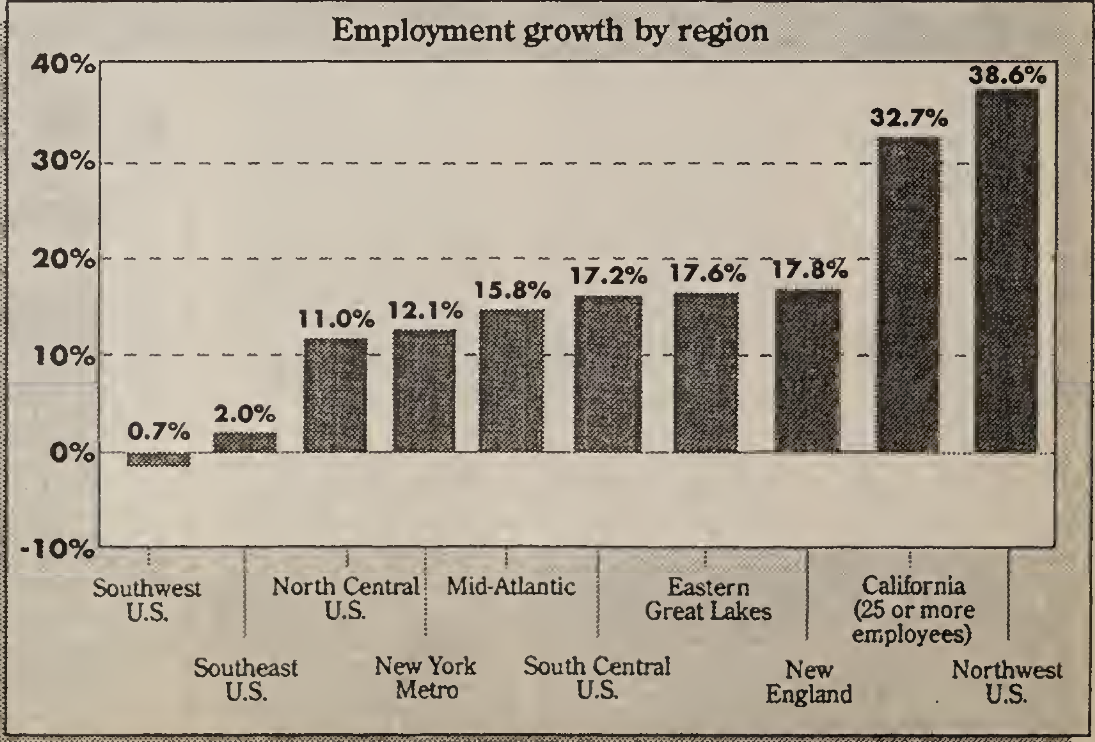

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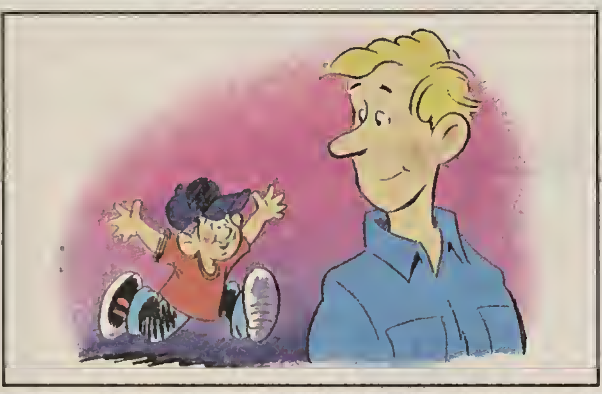

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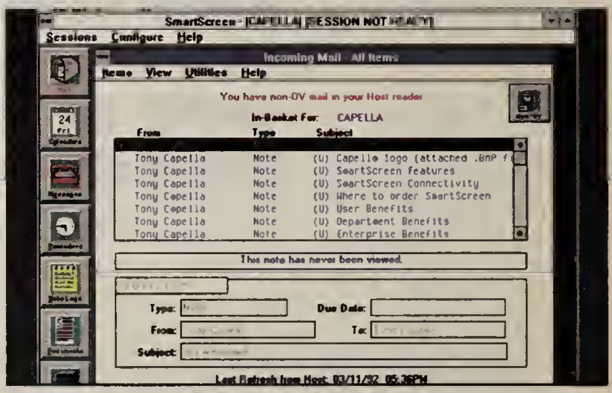
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# MARKETPLACE

# Haggling for fun and profit

BY DANIEL LYONS
SPECIAL TO CW

Even though he's buying computers with his employer's money, Carl Schwimmer negotiates as if he were paying for the equipment himself. "It's part of my nature to be a haggler," says Schwimmer, director of administrative services at the College of Business Administration at Northern Arizona University in Flagstaff.

"The worst thing a vendor can do is say no. I don't make it embarrassing, but I expect some kind of discount. If they don't come down, I walk away," he says.

Schwimmer is among those who believe it is almost always possible to get a better price on personal computers than what is advertised. Even discount shops will sweeten the deal if they're approached correctly, veteran hagglers say.

## Nonbargainers

Oddly enough, most people don't haggle at all, says Ed Samp, purchasing manager at JEM Computers, Inc., a mail-order reseller in Boston. Others agree. Dianne Ford, president of Focal Corp., a value-added reseller in Van Nuys, Calif., notes that 75% of the firm's customers accept the first proposal.

A buyer might not get a deal every time, "but it's a mistake not to ask," Samp says.

The idea is to know what you want, approach the vendor as a potential partner and keep the tone light. But make the seller know you mean business without being arrogant.

"Playing hardball would have the opposite effect; it just turns them off," says Jim Ramsey, information systems manager at ATR Wire & Cable Co. in Danville, Ky.

Ramsey has persuaded mail-order resellers to cut prices on low-end PCs by buying in quantity. "If they're selling PCs at $1,500, we'll offer to buy three for $4,200, and usually they go with it," he says.

Working with the dealer gets much better results, Ford says. "If they say they like my product, my solution, but they've got a budget problem — OK, then I can deal with that," Ford says.

For the truly driven, the price cut can be substantial.

Delmar Epton, executive vice president of the operations group at First Alabama Bancshares in Montgomery, Ala., recently used an updated version of the auction process to realize considerable savings on a used IBM 3090 Model 600J mainframe.

Epton's first plan was to hold an open conference call with all interested vendors. However, resellers didn't want to be on the line together, so they replied by fax.

In less than six hours, Epton reviewed three rounds of bids, each time announcing the lowest price and asking vendors to beat it. "By 2:30 in the afternoon we were done, and we'd saved $300,000 off the first-round best price," Epton says.

Epton advises potential buyers not to allow vendors to dicker with configuration at all. "We told them we did not want them to muddy the water. We issued the specs and told them to bid on that," he says.

## More bells and whistles

Hard-core negotiators acknowledge it is not always possible to get a cheaper price, but buyers can often get extra add-ins.

Schwimmer's most recent coup was persuading a Phoenix-based reseller (from which he'd bought 10 PCs) to loan him spare machines in case one of the 10 boxes failed.

"They know that if things work out, in six or seven months I'll buy those two spare PCs," Schwimmer says.

In fact, a vendor will be more likely to offer a deal if it thinks that will bring in more business later, resellers say.

However, no matter how good you are, the type of equipment you need will affect the discount. Savings from a PC deal amount to lunch money compared to costs cut from a mainframe deal.

Mike Baker, computer center manager at Avondale Mills, Inc. in Sylacauga, Ala., recently persuaded IBM to throw in $100,000 worth of free services with his purchase of an $800,000 Enterprise System/9000 mainframe.

"With a company like IBM, they have a set discount rate, and you don't have a lot of leeway," Baker says. "But we got some free contract programming, and they also paid for the wiring of a UPS system."

Once a reseller feels it is dealing with a serious buyer, there are deals to be had, Ford says. But the watchword is flexibility.

For instance, you might want to consider little-known brands over name brands.

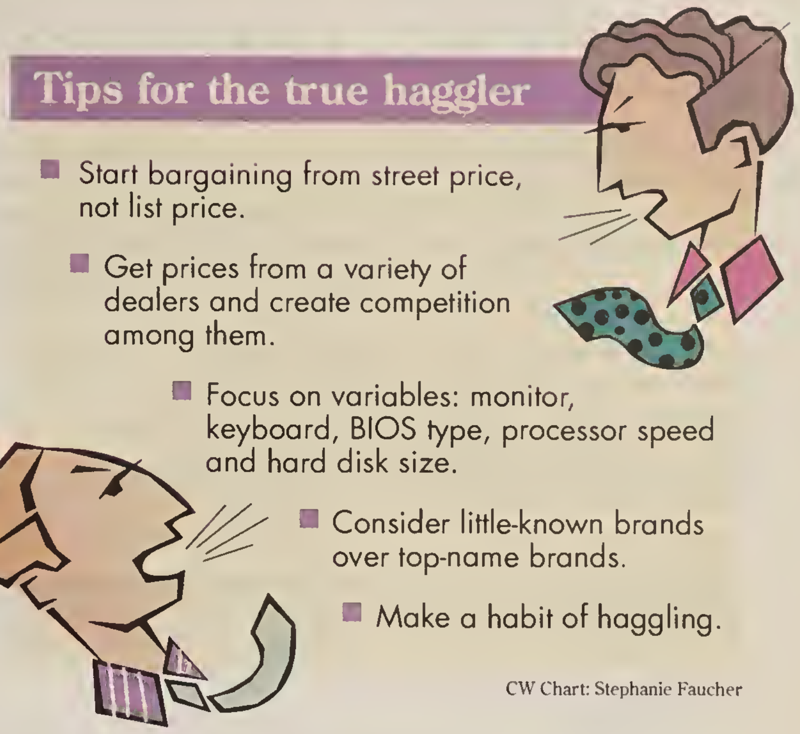
"Very often there is a substitute component that works just as well," says Robert Orbach, president of Orbach, Inc., a consulting firm in New York, and former director of business development at 47th Street Computer, a New York-based PC reseller.

Orbach also recommends that buyers forget list price. "The worst thing you can do is negotiate from list. You might get 40% off, but prices are changing so fast it might not mean much," he says. Your best bet is to negotiate from the street price.

One final tip from all those involved is to think of haggling as something enjoyable, not unpleasant.

"It's one of the fun things about my job," Schwimmer says. "And the resellers don't mind it a bit. The ones who deal with me a lot expect it."

Lyons is an Ann Arbor, Mich.-based free-lance writer.



### Tips for the true haggler

- Start bargaining from street price, not list price.
- Get prices from a variety of dealers and create competition among them.
- Focus on variables: monitor, keyboard, BIOS type, processor speed and hard disk size.
- Consider little-known brands over top-name brands.
- Make a habit of haggling.

CW Chart: Stephanie Faucher

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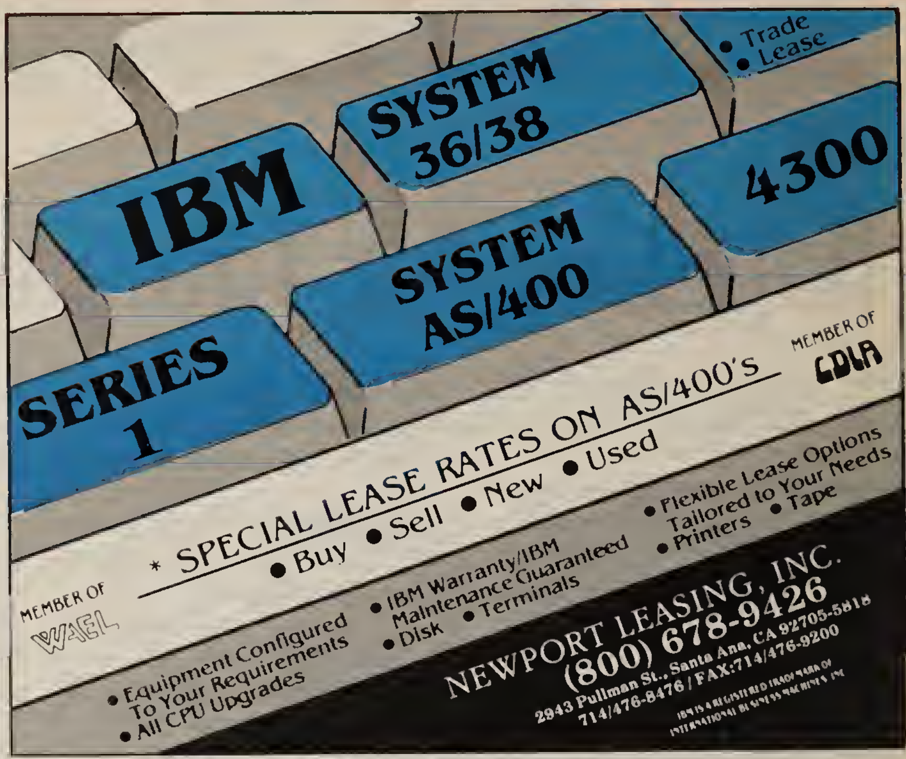

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| PS/2 Model 35SX | $1,325 | $1,500 | $800 |
| PS/2 Model 55SX | $1,000 | $1,300 | $800 |
| PS/2 Model 60 | $600 | $900 | $325 |
| PS/2 Model P70 | $2,000 | $2,500 | $1,500 |
| PS/2 Model 80 | $1,500 | $1,800 | $1,100 |
| PS/2 Model 95 | $4,400 | $5,000 | $4,000 |
| Compaq Portable II | $425 | $500 | $375 |
| Portable III | $500 | $600 | $250 |
| Portable 386 | $1,300 | $1,800 | $1,000 |
| SLT-286 | $700 | $900 | $400 |
| LTE-286 | $850 | $1,000 | $500 |
| Deskpro 286E | $500 | $1,000 | $325 |
| Deskpro 386/33 | $2,000 | $2,450 | $2,200 |
| Apple Macintosh Classic | $750 | $875 | $500 |
| SE | $725 | $775 | $500 |
| IIX | $2,550 | $2,850 | $2,000 |
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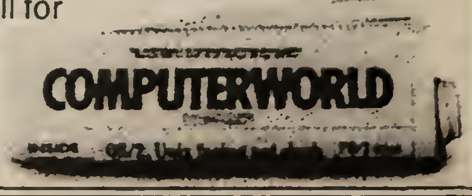

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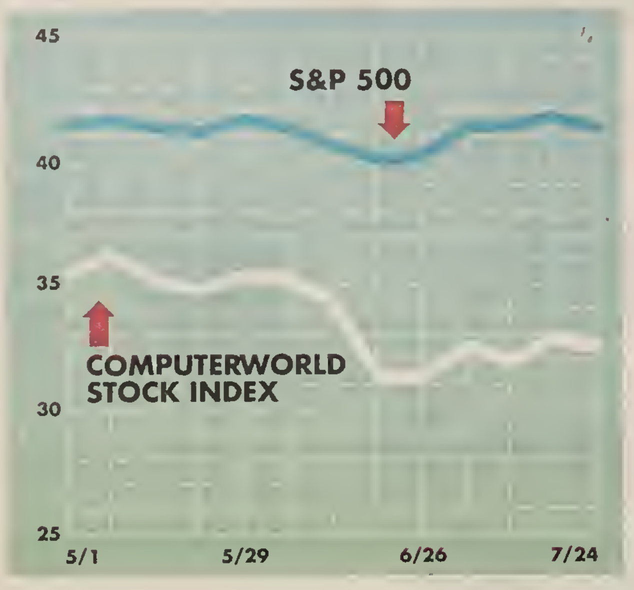

# Industry Almanac

## RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Commodore International Ltd.** (Alex. Brown & Sons, Inc.). Weak demand in Europe for consumer products continues to hamper Commodore (CBU), but a distribution deal with **Merisel, Inc.** (MSEL) should bring in an estimated $20 million during the next year.

DOWNGRADED FROM BUY TO HOLD: **Conner Peripherals, Inc.** (Bear, Stearns & Co.). Pricing in the disk-drive market is becoming cutthroat. With a price war going on in the personal computer industry, margins are falling across the board. The next six months look particularly harsh.

The longer term looks more promising. Conner (CNR) intends to enter the tape drive industry and is repositioning itself as a storage solutions company. Plans include building a backup tape drive using magnetic recording technology from **3M Co.** (MMM). Conner will also ship five disk drives this quarter for machines ranging from subnotebooks to workstations. Also in the works are drives preloaded with applications and operating system software.

LISA DAVIDSON

### Storage dimensions

*Brokerage firms measure up selected storage stocks*

| | Bear, Stearns & Co. | Shearson Lehman Brothers, Inc. |
|---|---|---|
| Conner Peripherals, Inc. | Hold | Buy |
| Maxtor Corp. | Buy | Neutral |
| Micropolis Corp. | Avoid | Outperform |
| Quantum Corp. | Hold | Outperform |
| Seagate Technology, Inc. | Hold | Neutral |
| Storage Technology Corp. | Not rated | Outperform |

# Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JULY 24, 1992

### TOP PERCENT GAINERS

| | |
|---|---|
| Intelligent Electronics | 32.26 |
| Gateway Communications | 29.96 |
| 3 COM Corp.* | 23.75 |
| Phoenix Technologies | 21.88 |
| Cypress Semiconductor Corp | 20.31 |
| Informix Corp. | 19.67 |
| Octel Communications Corp. | 19.10 |
| Maxtor Corp.* | 18.18 |

### TOP PERCENT LOSERS

| | |
|---|---|
| Symantec Corp. | -39.93 |
| IPL Systems Inc. | -32.90 |
| Cognitronics Corp. (H) | -32.62 |
| Compression Labs Inc. (L) | -28.89 |
| Amdahl Corp.* | -20.98 |
| Cambex Corp. | -20.54 |
| Cray Computer (L) | -18.18 |
| Cray Research Inc.* | -16.81 |

### TOP DOLLAR GAINERS

| | |
|---|---|
| Informix Corp. | 6.00 |
| Storage Technology* | 5.25 |
| Compaq Computer Corp.* | 4.50 |
| Octel Communications Corp. | 4.25 |
| Borland Int'l Inc.* | 2.63 |
| Dell Computer Corp. | 2.50 |
| Hewlett-Packard Co.* | 2.50 |
| Cisco Systems Inc. (H) | 2.50 |

### TOP DOLLAR LOSERS

| | |
|---|---|
| Symantec Corp. | -13.38 |
| Matsushita Electronics | -8.88 |
| Adobe Systems Inc. | -7.00 |
| IPL Systems Inc. | -6.38 |
| Cognitronics Corp. (H) | -5.75 |
| Cray Research Inc.* | -4.88 |
| Amdahl Corp.* | -3.75 |
| Northern Telecom Ltd.* (L) | -3.63 |

### Communications and Network Services Up 0.76%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 15.00 | 6.75 | 3 COM Corp.* | 12.38 | 2.38 | 23.75 |
| NYS | 68.00 | 56.25 | American Info Techs Corp.*(H) | 67.75 | 0.38 | 0.56 |
| NYS | 44.88 | 32.88 | AT&T*(H) | 43.00 | -1.50 | -3.37 |
| OTC | 4.25 | 1.00 | Artel Communication Corp. | 1.38 | 0.00 | 0.00 |
| NYS | 50.63 | 40.25 | Bell Atlantic Corp. | 46.75 | -0.63 | -1.32 |
| NYS | 53.25 | 43.38 | Bellsouth Corp. (H) | 50.63 | -2.00 | -3.80 |
| NYS | 7.25 | 4.13 | Bolt, Beranek & Newman | 4.50 | -0.13 | -2.70 |
| NYS | 65.88 | 36.63 | Cabletron Systems | 52.50 | 1.00 | 1.94 |
| OTC | 31.00 | 14.75 | Chipcom Corp. | 22.00 | 0.25 | 1.15 |
| OTC | 51.75 | 18.25 | Cisco Systems Inc. (H) | 51.75 | 2.50 | 5.08 |
| OTC | 35.25 | 8.00 | Compression Labs Inc. (L) | 8.00 | -3.25 | -28.89 |
| OTC | 3.38 | 0.88 | Data Switch Corp. | 1.75 | 0.19 | 11.96 |
| NYS | 23.63 | 12.38 | Digital Comm. Assoc.* | 18.75 | -0.38 | -1.96 |
| OTC | 17.50 | 8.25 | Digital Systems Int'l Inc.(L) | 8.63 | -0.13 | -1.43 |
| OTC | 7.00 | 3.63 | DSC Communications | 6.13 | 0.75 | 13.95 |
| OTC | 10.88 | 4.75 | Fibronix Int'l Inc. | 5.50 | 0.00 | 0.00 |
| OTC | 37.50 | 10.50 | Filenet Corp. | 15.50 | -0.75 | -4.62 |
| OTC | 3.38 | 1.13 | Gandalf Technologies Inc. | 2.56 | -0.06 | -2.36 |
| OTC | 2.31 | 0.69 | Gateway Communications | 1.22 | 0.28 | 29.96 |
| NYS | 5.50 | 2.13 | General Datacomm Inds. | 3.88 | 0.13 | 3.33 |
| ASE | 5.88 | 0.50 | Go Video | 2.75 | -0.25 | -8.33 |
| NYS | 35.00 | 28.13 | GTE Corp.* | 34.13 | 1.13 | 3.41 |
| NYS | 70.63 | 50.00 | ITT Corp. | 65.00 | 0.25 | 0.39 |
| OTC | 36.13 | 25.25 | MCI Commmunications Corp. | 32.38 | -0.63 | -1.89 |
| OTC | 14.50 | 2.25 | Microcom Inc. | 3.63 | -0.38 | -9.38 |
| NYS | 18.25 | 9.50 | Network Equipment Tech.* | 10.25 | -1.13 | -9.89 |
| OTC | 25.50 | 6.75 | Network General | 9.50 | 0.00 | 0.00 |
| OTC | 20.00 | 8.50 | Network Systems Corp. | 10.75 | 0.88 | 8.86 |
| OTC | 17.88 | 5.50 | Newbridge Networks Corp. | 15.75 | -0.25 | -1.56 |
| NYS | 49.25 | 33.75 | Northern Telecom Ltd.* (L) | 35.25 | -3.63 | -9.32 |
| OTC | 65.00 | 27.13 | Novell Inc.* | 54.00 | 0.00 | 0.00 |
| NYS | 82.38 | 69.13 | Nynex Corp.* | 80.38 | -0.63 | -0.77 |
| OTC | 37.50 | 16.50 | Octel Communications Corp. | 26.50 | 4.25 | 19.10 |
| OTC | 9.88 | 4.25 | Penril Data Comm. Ntwks. (L) | 4.25 | -0.50 | -10.53 |
| OTC | 53.00 | 17.00 | Picturetel Corp. (L) | 18.75 | 0.88 | 4.90 |
| OTC | 18.75 | 9.75 | Proteon Inc. | 13.50 | 1.00 | 8.00 |
| NYS | 25.50 | 11.63 | Scientific Atlanta Inc. | 24.63 | -0.25 | -1.01 |
| NYS | 66.25 | 51.50 | Southwestern Bell Corp. (H) | 64.63 | -1.38 | -2.08 |
| NYS | 27.63 | 20.75 | Sprint Corp. | 22.13 | -0.13 | -0.56 |
| OTC | 13.75 | 4.00 | Standard Microsystems Corp | 11.50 | -0.63 | -5.15 |
| OTC | 33.50 | 14.25 | Synoptics Communications | 33.00 | 1.13 | 3.53 |
| NYS | 39.00 | 32.88 | U S West Inc. | 39.00 | 0.63 | 1.63 |
| OTC | 41.25 | 21.25 | Wellfleet Communications | 33.13 | 0.75 | 2.32 |

### PC and Workstations Up 2.31%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 15.25 | 4.50 | Advanced Logic Research (L) | 5.25 | 0.25 | 5.00 |
| OTC | 70.00 | 42.75 | Apple Computer Inc.* | 45.88 | 0.88 | 1.94 |
| OTC | 32.25 | 12.00 | AST Research Inc.* | 13.13 | -0.13 | -0.94 |
| NYS | 19.25 | 9.00 | Commodore Int'l (L) | 9.63 | 0.13 | 1.32 |
| NYS | 37.50 | 22.13 | Compaq Computer Corp.* | 29.50 | 4.50 | 18.00 |
| OTC | 29.00 | 13.91 | Dell Computer Corp. | 20.50 | 2.50 | 13.89 |
| OTC | 7.75 | 3.00 | Everex Systems Inc. | 3.13 | 0.00 | 0.00 |
| NYS | 34.00 | 21.25 | Harris Corp. | 27.38 | -0.50 | -1.79 |
| NYS | 85.00 | 44.63 | Hewlett-Packard Co.* | 71.50 | 2.50 | 3.62 |
| NYS | 29.75 | 14.13 | Silicon Graphics | 18.25 | -0.75 | -3.95 |
| OTC | 35.88 | 20.75 | Sun Microsystems Inc.* | 28.00 | 0.50 | 1.82 |
| NYS | 31.25 | 22.50 | Tandy Corp.* (L) | 24.25 | 1.25 | 5.43 |
| NYS | 11.13 | 5.13 | Zenith Electronics | 7.88 | 0.25 | 3.28 |
| OTC | 25.50 | 4.88 | Zeos International Ltd. | 4.88 | -0.88 | -15.22 |

### Large Systems Off 3.93%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| ASE | 20.63 | 11.63 | Amdahl Corp.* | 14.13 | -3.75 | -20.98 |
| NYS | 16.00 | 7.50 | Ceridian Corp. | 15.50 | 1.00 | 6.90 |
| NYS | 16.38 | 5.88 | Convex Computer (L) | 5.88 | -0.38 | -6.00 |
| OTC | 19.63 | 2.25 | Cray Computer (L) | 2.25 | -0.50 | -18.18 |
| NYS | 52.25 | 24.13 | Cray Research Inc.* | 24.13 | -4.88 | -16.81 |
| NYS | 22.50 | 7.13 | Data General Corp. | 8.88 | 0.38 | 4.41 |
| NYS | 70.38 | 33.25 | Digital Equipment Corp.* | 40.38 | -3.00 | -6.92 |
| NYS | 106.38 | 81.63 | IBM* | 92.50 | -2.38 | -2.50 |
| NYS | 125.00 | 93.50 | Matsushita Electronics | 95.00 | -8.88 | -8.54 |
| OTC | 19.75 | 9.50 | Pyramid Technology | 10.25 | -0.50 | -4.65 |
| OTC | 17.88 | 7.50 | Sequent Computer Sys. | 15.00 | 0.63 | 4.35 |
| OTC | 18.38 | 5.00 | Sequoia Systems Inc. (L) | 6.38 | 0.63 | 10.87 |
| NYS | 54.25 | 34.00 | Stratus Computer Inc.* | 41.75 | 0.75 | 1.83 |
| NYS | 15.13 | 9.50 | Tandem Computers Inc.* | 10.88 | 0.63 | 6.10 |
| NYS | 11.75 | 3.63 | Unisys Corp.* | 9.88 | 0.25 | 2.60 |
| ASE | 7.50 | 2.00 | Wang Labs Inc. (b)* | 2.75 | -0.50 | -15.38 |

### Software Up 1.33%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 68.50 | 36.25 | Adobe Systems Inc. | 36.25 | -7.00 | -16.18 |
| OTC | 13.25 | 2.50 | AI Corp. | 3.00 | 0.00 | 0.00 |
| OTC | 45.00 | 11.50 | Aldus Corp. | 14.50 | 0.50 | 3.57 |
| OTC | 19.75 | 10.13 | American Software Inc. | 13.88 | 0.75 | 5.71 |
| OTC | 20.00 | 7.50 | Ask Computer Systems | 13.00 | 0.63 | 5.05 |
| OTC | 57.25 | 23.25 | Autodesk Inc. | 39.13 | 1.13 | 2.96 |
| OTC | 37.75 | 8.25 | Bachman Info. Systems | 11.25 | -0.13 | -1.10 |
| OTC | 42.50 | 29.00 | BGS Systems Inc. | 35.88 | -0.13 | -0.35 |
| OTC | 79 00 | 37.25 | BMC Software Inc. | 48.75 | 2.00 | 4.28 |
| OTC | 20.50 | 9.00 | Boole & Babbage | 17.75 | 0.25 | 1.43 |
| OTC | 86.75 | 36.50 | Borland Int'l Inc.* | 39.63 | 2.63 | 7.09 |
| OTC | 11.25 | 3.63 | CE Software | 4.50 | 0.38 | 9.09 |
| ASE | 14.38 | 6.50 | Cheyenne Software Inc. | 10.50 | -0.75 | -6.67 |
| OTC | 20.38 | 7.25 | Cognos Inc. | 8.88 | 0.50 | 5.97 |
| NYS | 17.00 | 7.50 | Computer Associates* | 13.75 | 1.75 | 14.58 |
| OTC | 21.50 | 8.50 | Comshare Inc. (L) | 8.75 | 0.25 | 2.94 |
| OTC | 47.88 | 6.50 | Easel Corp. | 7.50 | -0.25 | -3.23 |
| OTC | 19.50 | 9.25 | Goal Systems Int'l | 18.38 | 0.13 | 0.68 |
| OTC | 25.50 | 11.50 | Group I Software | 19.00 | 1.00 | 5.56 |
| OTC | 6.63 | 3.50 | Hogan Systems Inc. | 4.63 | 0.25 | 5.71 |
| OTC | 36.25 | 18.50 | Information Resources | 25.00 | 1.00 | 4.17 |
| OTC | 36.50 | 5.50 | Informix Corp. | 36.50 | 6.00 | 19.67 |
| OTC | 22.75 | 12.50 | Intergraph Corp. | 14.25 | 0.00 | 0.00 |
| OTC | 15.00 | 5.13 | Interleaf Inc. | 10.00 | 0.25 | 2.56 |
| OTC | 20.25 | 8.50 | Intersolv Inc. | 13.50 | 1.63 | 13.68 |
| OTC | 30.00 | 10.50 | Knowledgeware Inc. | 12.75 | 0.00 | 0.00 |
| OTC | 45.25 | 20.25 | Legent Corp.* | 35.38 | 0.00 | 0.00 |
| OTC | 40.75 | 15.50 | Lotus Development* | 18.75 | 0.88 | 4.90 |
| OTC | 7.38 | 2.06 | Meca Software | 2.25 | 0.00 | 0.00 |
| OTC | 22.25 | 6.50 | Mentor Graphics | 8.75 | -0.13 | -1.41 |
| OTC | 20.50 | 6.50 | Micrografx Inc. | 9.13 | -0.63 | -6.41 |
| OTC | 88.84 | 45.84 | Microsoft Corp.* | 72.75 | 2.50 | 3.56 |
| OTC | 21.13 | 8.88 | Oracle Corp.* | 18.88 | 0.13 | 0.67 |
| OTC | 41.25 | 13.00 | Parametric Technology | 33.75 | -0.75 | -2.17 |
| OTC | 11.00 | 3.50 | Phoenix Technologies | 4.88 | 0.88 | 21.88 |
| OTC | 25.25 | 10.63 | Platinum Technology | 17.25 | 0.00 | 0.00 |
| OTC | 46.50 | 27.50 | Progress Software Corp. | 38.00 | 1.75 | 4.83 |
| OTC | 26.63 | 4.00 | Quarterdeck Office Sys. | 4.88 | 0.13 | 2.63 |
| OTC | 32.75 | 10.25 | Rainbow Technologies Inc. | 17.75 | 0.75 | 4.41 |
| OTC | 29.50 | 8.75 | Rasterops | 11.50 | 0.25 | 2.22 |
| OTC | 17.25 | 5.38 | Ross Systems | 8.00 | 0.50 | 6.67 |
| OTC | 26.25 | 7.50 | Software Publishing Corp. (L) | 8.25 | 0.00 | 0.00 |
| OTC | 8.50 | 2.00 | Software Toolworks Inc. | 3.13 | -0.25 | -7.41 |
| OTC | 7.25 | 1.75 | Spinnaker Software | 2.75 | -0.25 | -8.33 |
| OTC | 16.50 | 6.25 | State of the Art | 7.25 | 0.13 | 1.75 |
| NYS | 25.25 | 11.63 | Sterling Software Inc. | 16.13 | -0.75 | -4.44 |
| OTC | 30.00 | 13.00 | Struct. Dynamics Research | 16.50 | 0.50 | 3.13 |
| OTC | 31.75 | 15.00 | Sybase Inc. | 28.25 | 1.75 | 6.60 |
| OTC | 51.00 | 20.13 | Symantec Corp. | 20.13 | -13.38 | -39.93 |
| NYS | 15.50 | 5.63 | Systems Center Inc.* (L) | 5.63 | -0.13 | -2.17 |
| OTC | 34.25 | 8.66 | System Software Assoc. | 27.25 | 0.50 | 1.87 |
| OTC | 23.75 | 14.50 | Walker Interactive Systems | 15.25 | -0.75 | -4.69 |
| OTC | 6.63 | 2.13 | Wordstar | 2.50 | -0.13 | -4.76 |

### Semiconductors Up 1.87%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| NYS | 21.50 | 7.38 | Advanced Micro Devices | 8.50 | -0.13 | -1.45 |
| NYS | 11.13 | 7.00 | Analog Devices Inc. | 9.38 | -0.50 | -5.06 |
| OTC | 14.13 | 6.75 | Atmel Corp. | 8.88 | -0.50 | -5.33 |
| OTC | 14.13 | 4.75 | Chips and Technologies (L) | 4.75 | -0.50 | -9.52 |
| NYS | 22.63 | 7.38 | Cypress Semiconductor Corp | 9.63 | 1.63 | 20.31 |
| NYS | 10.13 | 6.25 | Dallas Semiconductor | 9.63 | 0.25 | 2.67 |
| OTC | 68.75 | 38.50 | Intel Corp.* | 58.25 | 2.25 | 4.02 |
| NYS | 9.88 | 5.50 | LSI Logic Corp. (L) | 5.50 | -0.25 | -4.35 |
| NYS | 22.38 | 11.13 | Micron Technology | 15.00 | 1.00 | 7.14 |
| NYS | 83.75 | 54.00 | Motorola Inc.* | 83.63 | 0.63 | 0.75 |
| NYS | 11.50 | 3.88 | National Semiconductor* | 9.75 | 0.50 | 5.41 |
| OTC | 27.00 | 11.00 | Sierra Semiconductor (L) | 11.13 | -0.38 | -3.26 |
| NYS | 40.50 | 26.00 | Texas Instruments* | 40.50 | 0.88 | 2.21 |
| OTC | 10.50 | 5.88 | VLSI Technology | 6.13 | -0.50 | -7.55 |
| OTC | 9.75 | 2.13 | Weitek (L) | 3.00 | 0.38 | 14.29 |
| ASE | 5.63 | 2.00 | Western Digital Corp. | 4.88 | 0.25 | 5.41 |
| OTC | 32.50 | 17.25 | Xilinx | 20.75 | -0.38 | -1.78 |
| OTC | 11.50 | 4.63 | Zilog Inc. | 7.00 | 0.63 | 9.80 |

### Peripherals and Subsystems Off 0.89%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 10.00 | 2.75 | Archive Corp. | 7.88 | 0.50 | 6.78 |
| OTC | 24.50 | 11.25 | Banctec Inc. | 21.75 | 0.38 | 1.75 |
| OTC | 23.50 | 7.00 | Cambex Corp. | 11.13 | -2.88 | -20.54 |
| ASE | 18.38 | 7.00 | Cognitronics Corp. (H) | 11.88 | -5.75 | -32.62 |
| NYS | 23.88 | 12.50 | Conner Peripherals* | 20.38 | 1.25 | 6.54 |
| ASE | 19.66 | 3.41 | Dataram Corp. | 13.13 | 0.50 | 3.96 |
| NYS | 19.25 | 5.88 | EMC Corp. (H) | 16.13 | -1.00 | -5.84 |
| OTC | 9.38 | 4.75 | Emulex Corp. | 6.88 | 0.00 | 0.00 |
| OTC | 23.00 | 14.25 | Evans & Sutherland (L) | 14.75 | -0.13 | -0.84 |
| OTC | 40.63 | 16.00 | Exabyte | 29.75 | 2.00 | 7.21 |
| OTC | 27.25 | 15.75 | Intelligent Info. Systems | 25.00 | -1.00 | -3.85 |
| OTC | 11.25 | 4.63 | Iomega Corp. | 5.50 | -0.25 | -4.35 |
| OTC | 34.75 | 13.00 | IPL Systems Inc. | 13.00 | -6.38 | -32.90 |
| OTC | 24.50 | 10.75 | Komag Inc. | 13.50 | 0.88 | 6.93 |
| OTC | 14.00 | 2.63 | Maxtor Corp.* | 13.00 | 2.00 | 18.18 |
| OTC | 12.63 | 5.75 | Micropolis Corp. | 9.75 | 0.50 | 5.41 |
| NYS | 99.75 | 83.50 | 3M Co. (H) | 98.38 | -0.50 | -0.51 |
| OTC | 7.75 | 3.50 | Printronix Inc. | 5.25 | 0.25 | 5.00 |
| NYS | 26.75 | 7.00 | QMS Inc. | 7.75 | 0.25 | 3.33 |
| OTC | 18.00 | 8.88 | Quantum Corp. | 13.75 | -0.38 | -2.65 |
| OTC | 12.75 | 5.13 | Radius Inc. (H) | 10.63 | 0.00 | 0.00 |
| NYS | 12.88 | 5.88 | Recognition Equipment | 7.75 | -0.38 | -4.62 |
| OTC | 13.13 | 5.38 | Rexon Inc. | 9.25 | -0.38 | -3.90 |
| OTC | 17.63 | 7.25 | Seagate Technology* | 15.13 | 0.63 | 4.31 |
| NYS | 78.00 | 28.13 | Storage Technology* | 36.13 | 5.25 | 17.00 |
| NYS | 30.88 | 16.00 | Tektronix Inc. | 18.25 | 0.13 | 0.69 |
| NYS | 82.25 | 52.63 | Xerox Corp. | 72.50 | 1.13 | 1.58 |

### Services Up 1.50%

| Exch | 52-Week | Range | | July 24 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 18.00 | 11.66 | American Mgmt. Systems* | 16.75 | 1.00 | 6.35 |
| NYS | 5.38 | 2.88 | Anacomp Inc. | 3.38 | 0.25 | 8.00 |
| OTC | 19.00 | 12.25 | Analysts Int'l | 16.75 | -0.25 | -1.47 |
| NYS | 49.00 | 30.25 | Auto Data Processing* | 42.63 | 0.63 | 1.49 |
| NYS | 24.16 | 12.50 | Comdisco Inc.* | 15.50 | -0.50 | -3.13 |
| OTC | 13.50 | 7.75 | Computer Horizons | 8.75 | 0.00 | 0.00 |
| NYS | 84.88 | 52.25 | Computer Sciences* | 59.25 | -0.63 | -1.04 |
| NYS | 10.13 | 7.00 | Computer Task Group | 8.13 | 0.13 | 1.56 |
| OTC | 40.50 | 15.00 | CompUSA Inc. | 24.50 | -1.75 | -6.67 |
| OTC | 19.25 | 7.50 | Corporate Software (L) | 7.50 | -1.00 | -11.76 |
| OTC | 30.75 | 12.75 | Egghead Discount Software | 17.50 | 0.50 | 2.94 |
| NYS | 33.06 | 23.19 | General Motors E (EDS)* | 25.88 | -1.25 | -4.61 |
| OTC | 30.38 | 6.25 | Intelligent Electronics | 10.25 | 2.50 | 32.26 |
| OTC | 14.88 | 2.75 | Merisel | 9.88 | 0.25 | 2.60 |
| OTC | 15.75 | 7.00 | Microage Inc. | 9.00 | -0.50 | -5.26 |
| OTC | 27.50 | 13.84 | Paychex | 24.50 | 0.75 | 3.16 |
| NYS | 73.00 | 47.25 | Policy Management Sys. | 66.00 | -3.25 | -4.69 |
| NYS | 43.50 | 19.63 | Reynolds and Reynolds | 42.00 | 1.25 | 3.07 |
| OTC | 32.00 | 21.25 | SEI Corp. | 23.00 | -0.25 | -1.08 |
| OTC | 24.38 | 16.88 | Shared Medical Systems | 19.75 | 1.50 | 8.22 |
| OTC | 26.25 | 13.50 | Sungard Data Systems | 25.75 | 0.75 | 3.00 |
| NYS | 4.88 | 1.13 | Ultimate Corp. | 1.88 | 0.00 | 0.00 |

Note: Control Data Corp. changed its name to Ceridian Corp.

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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ABP

IN BRIEF

## DG suffers $11.7M loss

- As expected, **Data General Corp.** reported a fiscal third-quarter loss of $11.7 million on a 14% drop in sales. There was a silver lining: Sales of Unix systems surpassed those of DG's proprietary lines for the first time — but not enough to overcome the Westboro, Mass., firm's second consecutive unprofitable quarter.

- Belt-tightening measures at **Tandem Computers, Inc.** contributed to a 50% increase in fiscal third-quarter profits to $17.4 million. Revenue at the Cupertino, Calif., firm climbed 5% to $503.2 million from the comparable quarter last year.

- Citing domestic growth in sales to domestic telecommunications, retail, gaming and travel customers, **Stratus Computer, Inc.** posted a second-quarter profit of $13.5 million, up 28% from the year-earlier period. Revenue climbed 10% to $117.4 million, the Marlboro, Mass., company said.

- Blaming the "difficult global climate," **Cray Research, Inc.** reported that its second-quarter earnings declined 94% to $1.2 million. Revenue dropped 6% to $184.9 million for the period, the Eagan, Minn., firm said.

- **IBM Credit Corp.** reported preliminary second-quarter earnings of $52.7 million, up 26% from the comparable period last year. The Stamford, Conn., company said it originated financing for $4.2 billion worth of equipment, software and services during the first half of the year.

- Fiscal third-quarter profits at **Comdisco, Inc.** declined 36% to $12 million. Revenue for the Rosemont, Ill., lessor increased 9% to $561 million, compared to the year-earlier period.

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# Q2 view: Early bird does catch worm

*Software vendors that gambled on risky markets early cash in; latecomers lose out — for now*

BY CHRISTOPHER LINDQUIST
CW STAFF

Second-quarter financials released last week were dominated by the "haves," much to the chagrin of the "have-nots."

Vendors that have established themselves in what were once considered risky markets, such as Microsoft Corp.'s Windows and relational databases, hit pay dirt, while those that only recently jumped in often found themselves floundering.

The situation could change during the next year, however. Analysts indicated that the Windows software market will become more competitive as more vendors enter it. And mainframe software vendors, several of which showed significant revenue gains, may be riding a temporary wave of upgrades as customers purchase larger, more powerful machines with an eye toward consolidating data centers — and software licenses.

### And so it goes

The spate of quarterly financial reports issued last week broke down as follows:

• **PC software:** The bottom line is still strong for several personal computer software vendors, especially those with a strong Windows presence such as the king of the Windows hill — Microsoft itself. The Redmond, Wash.-based company tempered strong net income gains of 52%, with a note of caution concerning future earnings, however, indicating that it is simply getting too large to produce 50% yearly increases.

Analyst David Thomas at Prudential Securities, Inc. said increases of 33% to 35% would probably be more realistic for next year.

Pricing pressure in the Windows market will increase as Borland International, Inc. finally releases its Windows products later this year and companies such as Lotus Development Corp. and WordPerfect Corp. push upgraded — and more competitive — versions of their Windows products out the door.

For now, however, Borland is the one that is suffering, as evidenced by a 16.3% revenue decrease compared with the same quarter last year, attributed in part to its inability to produce Windows products. Another possible cause is its tendency to flood the channel with products that are not selling.

**Second-quarter earnings 1992**

| | Revenue April to June 1992 | Percent change from 1991 | Profit April to June 1992 | Percent change from 1991 |
|---|---|---|---|---|
| BMC Software | $50.5M | 30% | $13.2M | 45% |
| Borland | $114.8M | (16.3%) | $1.7M | (85.5%) |
| CA | $367.5M | 28% | $19.3M | 45% |
| Easel | $7.0M | 9% | $(585,000) | (150%) |
| Informix | $60.3M | 51% | $9.1M | 568% |
| Interleaf | $26.5M | 26% | $1.5M | 1,543% |
| Legent | $69.9M | 35% | $11.3M | 47% |
| Microsoft | $815.4M | 55% | $210.1M | 52% |
| Software Publishing | $35.1M | 10% | $679M | 5% |
| Sybase | $57.8M | 59% | $4.4M | 317% |
| Symantec | $60.2M | 39% | $6.4M | 66% |

CW Chart: Michael Siggins

"The one thing that seems to be happening is that they've been stuffing the channel like Ashton-Tate used to do, and that's a real dangerous thing," said Jeff Tarter, editor of the "Softletter" newsletter. He added, "You're making product and not getting paid for it."

And Lotus' numbers — a net income increase of $5.7 million — were not tremendous, though the firm's announcement a month ago of a less-than-optimal quarter drew some of the sting from the results.

• **Mainframe software:** Computer Associates International, Inc., Legent Corp., BMC Software, Inc. and Platinum Technology, Inc. all showed strong quarters despite the continued shrinkage of the overall mainframe hardware market. Indeed, CA's 28% increase established a new high-water mark for the company.

"CA still continues to be the mainframe software company users love to hate," said Peter Burris, director of commercial systems research at International Data Corp. in Framingham, Mass., "but they still realize they have trouble living without [CA]."

Legent also posted a record quarter, with overall revenue increases of 35%. Its international operations posted "dramatic" new sales growth.

The seeming contradiction between shrinking numbers of mainframes and increased software sales is explained by several factors, including the increased acceptance of IBM's DB2 relational database; the subsequent demand for DB2-related software; and an increase in processing power per system as customers upgrade to more powerful mainframes, according to Thomas.

"The more speed you have in a system, the more management it needs, and that is totally a software issue," he said.

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# Restructuring pays off: Compaq profits up 15%

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Severe cost-control measures and an avalanche of new product sales propelled Compaq Computer Corp. further along in its turnaround, as the personal computer giant posted second-quarter profits of $29 million, an increase of 15% over the same period last year.

The company last week reported sales of $827 million for the quarter ended June 30 — up 15% from the comparable period last year.

Rebounding from a year-long restructuring process, the company has been working to save its market share from lower priced clone makers while cutting its operating costs.

President and Chief Executive Officer Eckhard Pfeiffer attributed the resurgence to the company's mid-June price cut and product blitzkrieg, as well as the company's continued effort to cut expenses by reducing overhead and manufacturing costs.

Pfeiffer also pinpointed the increased distribution levels — which will see Compaq products in more than 1,000 superstores and mass market outlets by year's end — as a factor.

Although Pfeiffer would not disclose unit numbers, he claimed Compaq shipped "tens of thousands of the new products before the quarter closed."

### Back orders build up

In fact, the company had such a strong demand that the products are currently backlogged, necessitating triple shifts at Compaq's manufacturing plants here and in Singapore and double shifts at its Scotland site.

Pfeiffer said that although some machines should be out of backlog by the end of next month and others by September, everything from the June 15 announcement is on back order.

Analysts said that while the good news from Compaq is undoubtedly a plus, it is unclear whether the company will remain in the black.

"I don't think it indicates a PC recovery," said Joe McGlone, a principal at McGlone & Co. in Westport, Conn. "The predictability of earnings is still in question because of the glut of PC vendors."

Analysts did agree that the new products have provided a much-needed boost for the ailing vendor.

"It's like Apple all over again — when Apple cut prices and rolled the Classic out, business boomed," said Bill Bluestein, an analyst at Forrester Research, Inc.

He added that Compaq's increased distribution channels and new pressure on component suppliers to provide discounts also played a role in the resurgence.

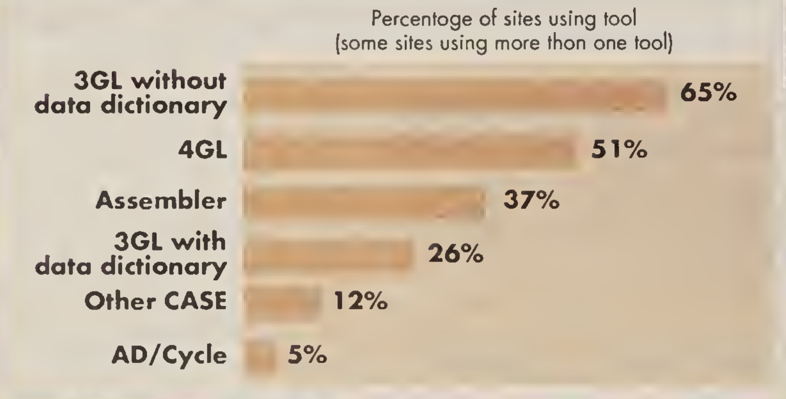
# TRENDS

## Application Development

The newer development methods have not displaced older technology at mainframe sites, which still struggle with poor documentation and maintenance.

### Tool mix

3GLs are used more than any other tool for application development.



### Maintenance snafus

Inaccurate or missing documentation is the most troublesome problem when maintaining applications. Missing source code is the least serious, but it is more common.

Percentage of sites encountering the following problems

| | Serious | Regular | Occasional |
|---|---|---|---|
| **Missing source code** | 1% | 5% | 68% |
| **Inconsistent data** | 4% | 18% | 51% |
| **Resistant object code** | 4% | 9% | 31% |
| **Unstructured code** | 7% | 26% | 44% |
| **Poor documentation** | 11% | 36% | 39% |

Base: 953
Multiple responses allowed; numbers have been rounded.

### Life cycle costs

Maintenance accounts for 32% of the total lifetime cost of applications development. During the past year, this cost has risen while others have dropped slightly.

Percentage of costs

| | 1992 | 1991 |
|---|---|---|
| **Maintenance** | 32% | 25% |
| **Programming** | 26% | 27% |
| **Application design** | 16% | 19% |
| **Testing/Integration** | 14% | 15% |
| **Requirements analysis** | 12% | 14% |

### Did you know?

Few sites (less than 2.5%) invest in re-engineering tools to make old applications more maintainable. This is surprising, given the level of expenditure on maintenance.

Source: Xephon WPWS, Oviedo, Fla.

## NEXT WEEK

Shape up and ship out: **Robert D. Kunisch**, PHH's chairman, president and CEO, is spearheading the use of information technology to bridge the gap between the relocation and real estate sides of his $4 billion Hunt Valley, Md., firm — and also to hone both businesses into nimble multinational competitors. See Manager's Journal.

Robert Smith Jr.

Software development is alive and well in the former Soviet Union, as In Depth reveals. The opportunities for U.S. companies are great. They can swap expertise in sales and marketing — areas in which Soviet developers are inexperienced — for access to inexpensive software engineering manpower skilled in PCs and object-oriented design.

# INSIDE LINES

## In the mail

▶ Mail 3.0 is apparently on its way, although about a month late. Sources close to Microsoft confirmed that the company will go on a press tour to unveil the product sometime this week, with the official announcement probably occurring at GroupWare '92 next week. And Windows for Workgroups is apparently shaping up nicely, a source says. The peer-to-peer version of Windows reportedly includes an enhanced File Manager with toolbar access to features, dual redirectors for Windows to Windows, and Windows to Novell NetWare, the yet-to-be-released Schedule Plus group scheduling package and a subset of the Mail 3.0 user interface.

## Losing its leaves

▶ Confirming long-circulating rumors, Banyan is talking to analysts and reporters this week about its plans to unbundle some of its networking services from its core Vines network operating system. The Westboro, Mass.-based vendor is expected to make utilities such as its highly acclaimed StreetTalk naming and directory service available for other LAN operating systems such as Novell's NetWare and Microsoft's LAN Manager.

## Sabre rattling

▶ Asked last week what he considers to be his company's top competitor, Oracle Corporate Vice President Terry Garnett blurted out, "DEC," without any hesitation. "We're facing an illegal competitor there. They give product [Rdb] away with the hardware, and that's how they've gained market share." Garnett said DEC is exhibiting the kind of bundling fervor last seen with IBM in the 1960s, adding that the Federal Trade Commission should investigate DEC. Will Oracle file papers to instigate such an investigation? "We're viewing that as an option," Garnett said.

## Unconfirmed

▶ AMR Corp.'s Confirm automated reservation system remained stuck in a holding pattern last week as the Dallas-based airline holding company waited for three key investors to fish or cut bait. Budget Rent A Car, Marriott and Hilton Hotels have until Friday to commit to Confirm or deal themselves out; as of late last week, they appeared to be taking their time.

## No veiled threat

▶ Bellcore has threatened legal action against *2600 Magazine*, a hacker publication in Middle Island, N.Y., that it claims published proprietary Bellcore internal information. Editor Emmanuel Goldstein won't say how he got the documents, which detail ways to remotely listen in on phone conversations, but he claims the publication is within its First Amendment rights to publish them.

## Petri dish

▶ A disturbing new package that has popped up on virus bulletin boards is called the "Virus Creation Laboratory" (VCL) which includes a development environment written in Borland C++, well-written documentation and eight sample viruses. The VCL makes virus writing a matter of picking options from pull-down menus. Infection type, encryption, etc., can be selected, as well as a range of nasty effects. Experts say any beginning DOS user can create working viruses with this package. Although it isn't the first attempt at such a package, it appears to be the most user-friendly.

*Pundits are still puzzling over what to call billionaire industrialist Ross Perot's withdrawal from his undeclared presidential candidacy — but at least one spokesman at EDS' Dallas headquarters knows exactly what to call it: Sweet Freedom. "I'm having the best work week I've had since the Perot campaign started," he exulted last week. "There have been whole days when just about all I've done is answer phone calls about Ross." The spotlight's glare may have given a particular headache to EDS, which has gone to great lengths to distance itself from its colorful but controversial Perotian origins. Phone, fax or CompuServe Assistant News Editor Patricia Keefe with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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